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ABSTRACT

This monograph, designed to help secondary students recognize symptoms of major dairy cattle diseases, stresses the need for preventative management practices and cooperation between the dairy farmer and the veterinarian. The first of three parts, The Healthy Animal, is divided into five units: body parts, vital signs, excretions, behavior, and reproductive characteristics. Part 2, Disease and Its Prevention, contains two units: the nature of disease and preventative management practices. The final part, Identifying and Treating Diseases, provides the following nine units: treating the diseased animal, reproductive diseases, mammary diseases, digestive diseases, respiratory diseases, structural diseases, other diseases, parasites, and calf diseases. Each part of the monograph is preceded by a vocabulary list. (LPA)

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DAIRY HERD HEALTH

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FOREWORD

Unhealthy or diseased cows do not have the milk producing potential or reproductive capacity necessary to yield profitable returns, and because of this, dairymen realize maintaining the health of their dairy herds is one of their most important economic concerns. Modern dairy farmers need to be aware of major cattle diseases, how to prevent them and how to treat them once they appear.

A survey of farm production and management teachers, conducted by Instructional Materials Service at Cornell, indicated a need for materials identifying major dairy diseases. The following publication is not intended to teach high school students how to become amateur veterinarians. Its purpose is to first help students recognize symptoms of major diseases, and secondly it tries to stress the need of preventative management practices and cooperation between the dairy farmer and the veterinarian.

Written words can never substitute for first-hand experience and visual observation. However, it is hoped the following descriptions will be helpful in teaching students to recognize signs of disease disorders, what immediate actions are necessary and when to call the veterinarian for assistance.

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PART I

THE HEALTHY ANIMAL

PART I VOCABULARY

aggressive (ag gres sive)	: pushy, nasty, forceful behavior
digestion (di ges tion)	: breakdown of food in the body
estrous (es trous)	: the series of hormone release and organ changes in the female body between heat periods
estrus (es trus)	: the heat period when the female will accept the male
heredity (he red i ty)	: qualities or characteristics received genetically
indicate (in di cate)	: to show (point out) a symptom or sign
inflammation (in flam ma tion)	: swollen, red, sore; a means by which the body removes damaged tissue and poisons
isolate (i so late)	: remove, set apart from others
lactation (lac ta tion)	: the period in which a cow produces milk
ligaments (lig a ment)	: tough, stringy tissue which holds an organ in place and connects bones
membrane (mem brane)	: a thin, soft layer of tissue
urinate (ur i nate)	: to pass water, discharge urine
vasectomized (va sec to mized)	: made sterile by minor surgery; severing the vas deferens of the male
veterinarian (vet er i nar i an)	: a person called too late, to perform the impossible for nothing in healing or caring for animals

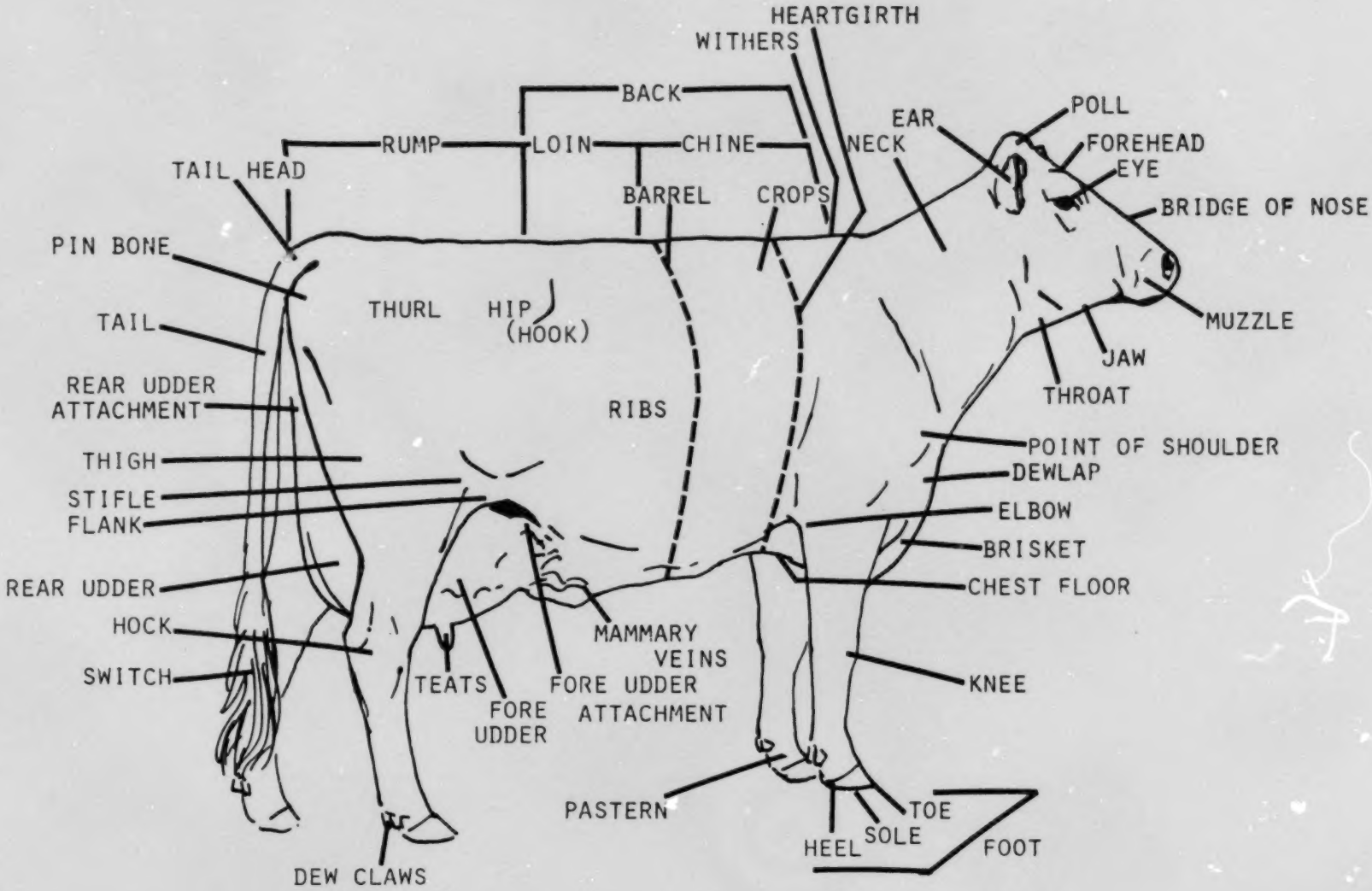
IDENTIFYING BODY PARTS

It is important to be able to name and locate the body parts of the dairy cow before using this guide. This knowledge is essential for understanding the disease descriptions, treatments, and preventative measures described.

Knowing the location and correct names of body parts is also important when consulting a veterinarian. Veterinarians usually expect a description of the problem and its location so they can come prepared to treat the cow. Finally, familiarity with the body parts will help in correctly following the veterinarian's treatment instructions.

Please memorize the body parts labeled in this diagram. Preceding some units are diagrams of the various body systems. Please study these before reading the unit to fully understand the information.

UNIT 1 BODY PARTS



EYES

Normal:

1. Bright
2. Clean
3. Alert

Abnormal:

1. Runny
2. Red, pink or discolored
3. Crusty

Comments:

1. Runny, red or crusty eyes occur with many resiratory infections. Call a veterinarian if these symptoms occur.
2. If other symptoms are not present, runny eyes could be due to dust or pollen.
3. If only one eye is affected, it may be injured, infected, or contain a foreign object.
4. If the eye is runny, discolored, and crusty, the cow may have pinkeye. (See page 79.)

SKIN & HAIR COAT

Normal:

1. Hair coat: shows "bloom" and is fine, glossy, and smooth
2. Skin: loose, stretchy, and easy to move in any direction

Abnormal:

1. Rough, coarse, and dry hair coat
2. Bald spots and scaly dry skin
3. Tight skin over the ribs and bones
4. Cold sweating or sweat in patches

Comments:

1. Internal and external parasites, poor diet, loss of body water, and disease can cause any of the abnormal signs; check with your veterinarian.
2. Brushing dairy cows and maintaining proper diet often improve the hair coat.

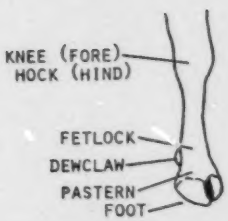
FEET & LEGS

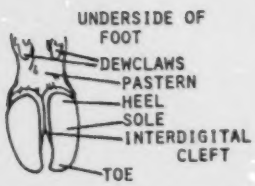
Normal:

1. Evenly balanced weight on all four legs, animal stands squarely on each hoof
2. Strong and clean hocks and knees
3. Strong and medium length pasterns
4. Free and easy walk

Abnormal:

1. Lameness
2. Rests on heels of feet when standing
3. Rocks backward while walking
4. Long, low, strained pasterns
5. Swollen, red, or bloody legs and/or hocks
6. Lies down or stands still for long periods of time and must be forced to walk
7. Crusty, dead tissue with a foul odor between toes
8. Dark, pus filled area on sole of foot.





Comments:

1. Many feet and leg problems are related to management and heredity.
2. Proper, regular foot care (hoof trimming) will help prevent lameness and foot rot.

MUCOUS MEMBRANES

linings of the nose, eye, lip, and vagina

Normal:

1. Moist
2. Pinkish color

Abnormal:

1. Change in lining color:
   a. pale - may indicate anemia (a ne mi a), low level of iron in the blood
   b. red - may indicate soreness or an infection
   c. blue - may indicate a heart or breathing problem
   d. yellow - may indicate jaundice (jaun dice), a condition when bile from the liver is deposited in the skin
2. Dry linings - may indicate fever, loss of body water, or irritation
3. Ulcers and/or erosions - may indicate an infection or contact with irritating substances or chemincals.

Comments:

1. If the mucous linings change color, call a veterinarian.
2. Mucous flow from the vagina is common with the different stages of the estrous cycle.

UNIT 2 VITAL SIGNS

BODY TEMPERATURE (tem per a ture)

Normal:

1. Cow: 38 - 39°C (100.5 - 102.5° F)
2. Calf: 37 - 39°C (99 - 102° F)

Abnormal:

1. Fever, temperature above 39° C (102.5°F)
2. Below 38° C (100.5° F)

Detection:

1. Tie a string with a clip at one end to the end of a rectal cattle thermometer.
2. Shake the thermometer down to 35.5° C (96° F) by holding the far end (not the bulb) and snapping your wrist.
3. Put the bulb end in the rectum and fasten the clip to the cow's hair.
4. After three minutes, remove the thermometer and take the reading.

Comments:

1. A cow's temperature will be in the high normal range after eating, exercise, excitement, heat (estrus), and on very warm days.
2. Calves' temperatures will change within the normal range during the day.
3. Fever is due to disease or injury and should not be treated unless the cause is known.
4. Signs of fever are:
   - dry and/or warm muzzle
   - ears that vary from hot to cold
   - thirst and less frequent urination
   - cow looks lifeless
   - loss of appetite
   - constipation (con sti pa tion): cannot defecate or expel manure
   - may look gaunt or full

HEART RATE

Number of heart beats per minute; also called the pulse

Normal:

1. Cow: 60 - 70 beats per minute while resting
2. Calf: more rapid

Abnormal

1. Faster or slower than 60 - 70 beats per minute
2. Uneven beats

Detection:

1. Place finger (not thumb) over the artery in one of the following places:
   a. under the jawbone at the submaxillary (sub max il lary) artery
   b. back of the front leg, close to the body at the metacarpal artery (meta car pal)
   c. under the tail, close to the body at the coccygeal (coc cy geal) artery

Comments:

1. If a cow has a fever, the pulse is usually rapid and faint.
2. Pulse will be faster after exercise, eating, and excitement, during hot weather, and at night.

RESPIRATION RATE (res pi ra tion)

Number of breaths per minute

Normal:

1. Cow: 30 breaths per minute
2. Even, regular breathing with only a slight raising of the ribs and a rustling sound

Abnormal:

1. Labored breathing
2. More than 30 breaths per minute or marked movement of the ribs while at rest
3. Wheezing or rasping sound

Detection: Any of the following methods may be used while the cow is resting:

1. Place your hand on the cow's ribs and count each outward movement for one minute.
2. Place a small mirror in front of the cow's nostril and count the number of times the mirror fogs in one minute.

RESPIRATION RATE - continued

3. Count the number of nostril movements or slight rustling sounds in one minute.

Comments: Change in the respiration rate is one of the first symptoms of many respiratory diseases. (See pages 67, 69)

UNIT 3 EXCRETIONS

NASAL DISCHARGE

Any flow or oozing from the nostrils

Normal:

1. Small beads of water below the nostrils
2. Slightly runny nostrils in cold weather or after exercise
3. Small amounts of dirt in the nostrils

Abnormal:

1. Thin watery discharge - may mean a slight respiratory (res pi ra to ry) infection
2. Fever with any one or more of the following discharges:
   a. pus or flakes
   b. red or reddish brown

Comments: Some respiratory infections, first seen as a runny nose, progress quickly. Do not waste time before calling a veterinarian.

URINE

Normal:

1. Fresh urine: clear, pale to amber yellow
2. 22.7 liters (6 gal.) per day (varies slightly with weather, feed, water, milk production, and exercise)

Abnormal:

1. Change in color or clearness
2. Change in amount or decrease in frequency
3. Pain when urinating

URINE - continued

Detection:

1. Take sample to check urine and urination.
   a. Restrain cow
   b. Rub finger lightly just below the vagina.
   c. As the cow lifts tail, place an unbreakable container in position to collect urine.

Comments:

1. Take temperature of cow that shows abnormal signs.
2. Test for various diseases with urine samples.
3. A veterinarian should be called immediately if the urine or urination is abnormal.

FECES

Manure

Normal:

1. For a 675 kg. (1500 lb.) cow, 41 kg. (90 lbs.) manure per day
2. Soft and moist
3. Brown to green in color

Abnormal:

1. Blood or pus in manure - may indicate infection in the digestive tract
2. Dry manure - may indicate that the diet is too dry or can't be digested (More water or grain may be needed.)
3. Diarrhea (di ar rhe a): a runny, watery manure with no shape - may be caused by a laxative (lax a tive) feed or infection
4. Large amounts of whole grains in the manure - may indicate that a cow is not chewing her feed correctly (check mouth and teeth) or may have a digestive problem
5. Scours: a sunny, sticky manure often yellow, white, or light brown in calves, sometimes bloody, and usually with fever and loss of body water (See page 98).

Comments:

1. A strange odor may indicate illness.
2. Diarrhea may also be seen with a nasal discharge or abortion; call the veterinarian.

COUGHS

Natural action to clear the throat of food, water, or other matter

Normal:

1. Strong
2. Loud

Abnormal:

1. Moist
2. Dry
3. Weak
4. Continued
5. Pus or blood is coughed up

Comments: Continued coughing can damage the lungs; call your veterinarian.

UNIT 4 BEHAVIOR

APPETITE & FEEDING HABITS

Normal:

1. 9 kg. (20 lbs.) of dry matter eaten daily by 675 kg. (1500 lb.) cow
2. 4 - 5 liters (1 - 1½ gals.) of water drank for each 3 - 4 liters (1 gal.) of milk produced
3. Eager to eat

Abnormal:

1. Drop in amount of forage or grain eaten
2. Change in amount of water drank

Comments:

1. Appetite and cud chewing indicate the general health of the animal.
2. Cattle will drink more water when they have a fever and during hot weather.
3. Cows hanging back from the feeder are often low on the pecking order. Aggressive animals will keep others from eating. Separate cattle by behavior and production.

TEMPERAMENT

Normal:

1. Social
2. Friendly to people

Abnormal:

1. Stands alone and shows signs of illness (droopy head or ears)
2. Aggressive, unfriendly actions

Comments:

1. Cattle stay together while feeding, grazing, and resting. Only cows ready to calf, or coming down with milk fever or nervous ketosis, will isolate themselves.
2. A cow acting ill should be isolated until the cause of behavior is known.

UNIT 5
REPRODUCTIVE CHARACTERISTICS

ESTRUS

Heat

Normal:

1. Lasts 10 to 30 hours (18 hours average)
2. Occurs every 17 to 25 days (21 days average)
3. Characteristics of the cow in heat:
   - Stands when mounted by another cow - interested in other cows
   - Red, swollen vulva
   - Clear flow from vulva
   - Bloody flow from vulva 35 - 45 hours after heat
   - Restless, nervous, and bawls often
   - Lacks appetite
   - Milk let-down does not occur, milk production drops

Abnormal:

1. No visible signs of heat
2. Cow remains in heat longer than 30 hours

ESTRUS - continued

3. Heat occurs irregularly or more often that every 17 days

Detection:

1. Watch for normal signs.
2. Use a vasectomized (va sec to mized) bull with a paint-marker on his brisket.
3. Glue commercial detection patches to the back of the cow just behind the hip, slightly off center of the backbone.

Comments:

1. Close observation on a set timetable and good records are important in breeding cows on time.

PARTURITION (par tu ri tion)

Giving birth, calving

Normal:

1. Cow lies on side or stands
2. Cow grunts or strains
3. Water gushes from vulva with or followed by the water bags or membranes
4. First, one hoof appears followed closely by the second hoof, with the sole of each hoof facing downward.
5. Nose appears next, the head extended, and laying on the legs.
6. Once the head passes the vulva the calf is usually expelled suddenly.
7. Placenta or afterbirth follows the calf, but it may hang from the vulva for several hours before being released.

Abnormal:

1. Cow grunts or strains for several hours with no other signs
2. Calf's leg sticking out from the vulva longer than an hour
3. Front leg(s) jutting out with the sole of the hoof facing up
4. One or both rear legs appearing first

Detection:

1. Vulva swollen for a few weeks to a few days
2. Udder filled with milk
3. Clear mucous flow in increasing amounts from the vulva
4. Relaxing or stretching of ligaments around the tail (occurs a few hours before calving)

PARTURITION - continued

5. Cow is restless, paces around pen, lies down and rises again, seeks place away from other cows and people

6. Loss of appetite

Comments:

1. After the calf is expelled its head may be covered with a membrane. Remove this if the cow does not attempt to so the calf does not suffocate.

2. Call your veterinarian right away if you think the cow is having problems and you lack experience in assiting the calving.

MILK PRODUCTION

Normal:

1. White to slightly yellow colored milk

2. Entirely liquid milk

3. Pleasant smelling and tasting milk

4. Amount of milk varies with each cow

Abnormal:

1. Sudden drop in production

2. Strange or unpleasant smelling milk

3. Bloody, watery, or clear milk with flakes - may indicate infection or injury

4. Flakes, clots, or thick milk and swollen, hard, or reddened quarter(s) - indicates mastitis (mas ti tis): an infection in the milk producing tissue (See page 55).

Comments:

1. Production is affected by diet, heredity, stage of lactation and disease. The person milking should know each cow's daily production and note sudden changes.

2. Colostrum (co los trum), the milk produced the first three days after calving, is very thick, yellow or bloody in color, and high in vitamins, minerals, and antibodies.

3. A "wood smoke" smell in the milk or urine is caused by the disease ketosis. (See page 81.)

4. Odors may result from eating some plants, such as mustard or onion.

VAGINAL DISCHARGE (vag i nal dis charge)

Any flow from the vagina

Normal:

1. Clear mucous flow during heat
2. Bloody mucous flow 25 - 45 hours after estrus
3. Expelled placenta (afterbirth)

Abnormal:

1. Bloody flow any time other than 25 - 45 hours after heat or after calving
2. Pus or cloudy flow
3. Foul-smelling or colored flow

Comments:

1. A bloody flow may indicate the following (all require veterinary care):
   a. ruptured vaginal cyst
   b. tumor or wart
   c. injury to the vagina or cervix

PART II

DISEASE AND ITS PREVENTION

UNIT 6 THE NATURE OF DISEASE

UNIT 6 VOCABULARY

contaminate (con tam i nate)	: to infect by contact, make unfit for use
external (ex ter nal)	: the outside or outer part
function (func tion)	: the activity a body part or organ performs; the purpose it exists for
immunity (im mu ni ty)	: a state of protection; power of the body to resist or overcome a disease
internal (in ter nal)	: in the inside of the body
low-grade infection (in fec tion)	: an infection which is hard to recognize by signs (shows few symptoms), but affects the body
parasite (par a site)	: an organism which lives off of another organism
resistance (re sis tance)	: the ability to resist or prevent a certain disease
RNA - DNA	: genetic material; RNA controls cell activity and DNA determines the characteristics and qualities of all living beings
secretion (se cre tion)	: release of material from the body
structure (struc ture)	: the form, shape, or organization of the body or body part
susceptible (sus cep ti ble)	: open or subject to disease
tissue (tis sue)	: a group of similar cells which form a body part
vaccine (vac cine)	: a mixture of dead microorganisms that are injected into an animal to make it immune to a disease

The Nature of Disease

Definition: A disease is any abnormal condition causing change in the structure or function of body tissue.

- Agents of Disease (called pathogens) -

1. Bacteria (bac te ri a): one-celled bodies of many shapes and sizes that can only be seen under a microscope

2. Virus (vi rus): much smaller than bacteria, contain genetic material (RNA and DNA), can reproduce only in living cells

3. Parasite (par a site): any creature or body which lives off of or in another creature, usually damaging the host's body

4. Fungus (fun gus): a plant that lacks green pigment and acts as a parasite, usually can be seen only under a microscope

5. Protozoan (pro to zo an): one-celled bodies that are larger than bacteria, but can only be seen under a microscope

6. Metabolic disorder (met a bol ic dis or der): a breakdown of normal body processes or functions

7. Poison (poi son): a substance that kills or injures tissue

8. Dietary deficiency (di e tar y de fi cien cy): a lack of required nutrients which weakens the body and affects the body's ability to fight disease

Definition: An infection is when a pathogen (the agent of disease) gains a stronghold in the body.

- Sources of Infection -

1. Blood-sucking insects

2. Direct contact with an infected animal

3. Direct contact with a carrier (A carrier is an animal which has developed resistance to the pathogen, but carries it and spreads the infection.)

4. Contact with contaminated feed, water, or other objects

5. Air-borne disease agents

6. Infection from organisms that occur naturally in the body

- Pathogen Action in the Body -

1. Pathogens (patho gens) enter the body.
2. Body cells and fluids breakdown.
3. Pathogens produce poisons called toxins.
4. Pathogens reproduce and multiply in number, causing more damage.

- Body Defenses that Prevent and Fight Disease -

1. Primary defense - prevents pathogens from entering the body
    a. skin, mucous membranes, and hair
    b. sweat, tears, and digestive juices
2. Secondary defense - fights pathogens that have entered the body
    a. Active immunity is built up by the animal's body after it has been exposed to a disease or vaccine. The immunity usually develops slowly but lasts a long time.
    b. Passive immunity is produced by another animal and injected or fed to the animal with no immunity. Colostrum and blood serum are examples.

- Possible Outcomes of Infection -

1. Pathogens enter the body and are destroyed by body defenses before any signs appear.
2. Pathogens are removed from the body in sweat, urine, or feces, or are killed by body secretions.
3. Pathogens are destroyed when the animal dies <u>and</u> the carcass is destroyed.
4. Body defenses and the pathogen reach a stalemate and the animal becomes a carrier.

- Factors Which Make the Body Susceptible to Disease -

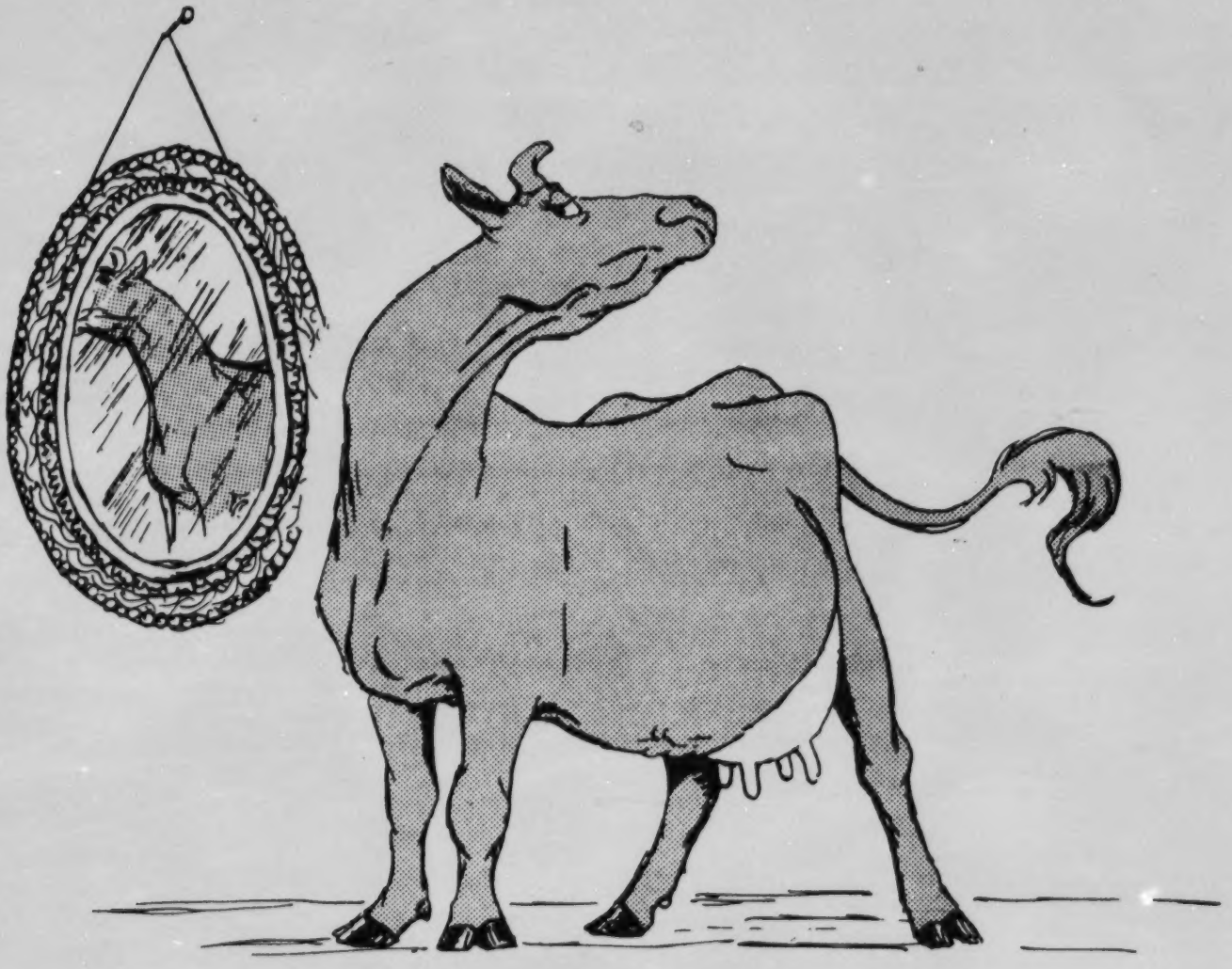
1. Stress or trauma - changes in temperature, shipping, poor housing (damp with poor ventilation), excitement, shock, calving.

2. Genetic defects or weaknesses - inheriting a lack of resistance to particular diseases or a failure of tissue to function properly

3. Dietary deficiencies - lack of nutrients needed for tissue to function properly, weakening resistance to disease

4. Presence of a low-grade infection or another disease - weakens the body, allowing other infection to enter

UNIT 7 PREVENTATIVE MANAGEMENT PRACTICES



UNIT 7 VOCABULARY

antibiotic	(an ti bi ot ic)	: a specific substance produced to kill a harmful microorganism in the body
autopsy	(au top sy)	: an examination of the body after death
balanced ration	(bal anced ra tion)	: a diet that contains all the basic nutrients needed by an animal
conditioning	(con di tion ing)	: the state of the body; in good shape; a healthy appearance with an even layer of fat covering the body
conformation	(con for ma tion)	: the shape, form, and structure of an animal
disinfectant	(dis in fec tant)	: a chemical which destroys harmful organisms
dry treat		: an antibiotic injected into the udder when drying a cow off (end of lactation)
electrolyte	(elec tro lyte)	: a mixture of salts (table salt, baking soda, potassium salt) that is fed to calves or cows that have lost large amounts of body water
facilities	(fa cil i ties)	: buildings and equipment used for a specific purpose
infuse	(in fuse)	: to place in a body cavity; to expose a body part or organ to a substance
sanitation	(san i ta tion)	: cleanliness to prevent disease
tincture of iodine	(tinc ture of i o dine)	: a dilution of iodine used to disinfect open wounds or body parts

Preventative Management Practices

-- habits that help prevent disease

- Constant Observation -

1. Know each cow and its habits.
2. Check cattle before feeding and milking.

- Facilities -

1. Provide shelter from the weather. Buildings should be free from drafts, dry, well-bedded, and properly ventilated.
2. Have a sanitation program:
    a. Disinfect stalls and feed areas at least once a year.
    b. Disinfect calf pens at least two or three times each year.
    c. Clean and disenfect waterers regularly.
    d. On a regular basis (at least every other month), completely clean milking equipment by taking it apart and using an acid solution to remove calcium deposits.
    e. Scrub calf pails after each use with a milk disinfectant.

- General Cleanliness -

1. Keep barns, feed lots, loafing lots, and pastures free from harmful objects, such as glass, tin cans, boards, and farm machinery.
2. Repair and maintain fences, buildings, equipment, and facilities with which cattle are in contact.
3. Provide feed bunks and hay racks that will not be easily contaminated by manure and urine and that are easy to clean regularly.

- Nutrition & Feeding Practices -

1. Provide a balanced ration
2. Feed cows according to the amount of milk they produce. (One pound of concentrate for every 2½ pounds of milk is usually recommended.)

3. Provide clean, fresh feeds.

   a. Hay should be green and leafy, and free from dust, mold, and poisonous weeds.

   b. Silage should be free from molds. Frozen or spoiled silage should not be fed.

   c. Grains or concentrates should be clean, and free from weevils and other insects, chemicals, dusts, and molds.

4. Provide plenty of clean fresh water.

5. Feed cattle at regular times.

- Health and Breeding Records -

1. Obtain record forms from farm supply businesses, breed organizations, Dairy Herd Improvement Association (DHIA), or develop your own.

2. Record information on each cow, including:

   a. General information - such as cow name, registration number, sire, dam, and date of birth

   b. Breeding history - such as dates bred and rebred, breeding problems, sire bred to, results of pregnancy checks, and calving dates and problems

   c. Calf information - such as birth date and weight, vaccinations received and numbers, date of dehorning and teat removal, special problems, and other information

   d. Health history - such as diseases contracted, treatment used, costs, vaccination for reproductive diseases and special practices; dehorning, receiving magnet, etc.

3. Use records to cull cows, to recognize family traits to be considered in breeding and in disease prevention, and to quickly and effectively treat disease.

4. Keep financial records of cattle sales.

- Milk Production Records -

1. Record pounds of milk produced.

2. Record mastitis treatment, frequency of occurrence, and withdrawal period of drugs used.

3. Record length of lactation, starting date, and drying-off date.

4. Record any special problems.

5. Use the infomation recorded in feeding and breeding each cow, bull selection, and culling.

- Culling -

1. Plan a culling program considering these factors:

   a. Cow production records

   b. Health and breeding records

   c. Cow behavior problems (aggressive, nasty cows)

   d. Conformation

- Breeding Practices -

1. Heat detection - Check cattle during the day and once during the evening. Vasectomized bulls with paint markers or commercial heat detection patches may be used.

2. Ask your artificial breeding service agent when to contact him/her if cows are in heat.

3. Breed heifers according to their <u>weight</u>, rather than age, as indicated in the chart below. (Heifers will have less difficulty calving if they are bred at the suggested weights and fed properly during gestation.)

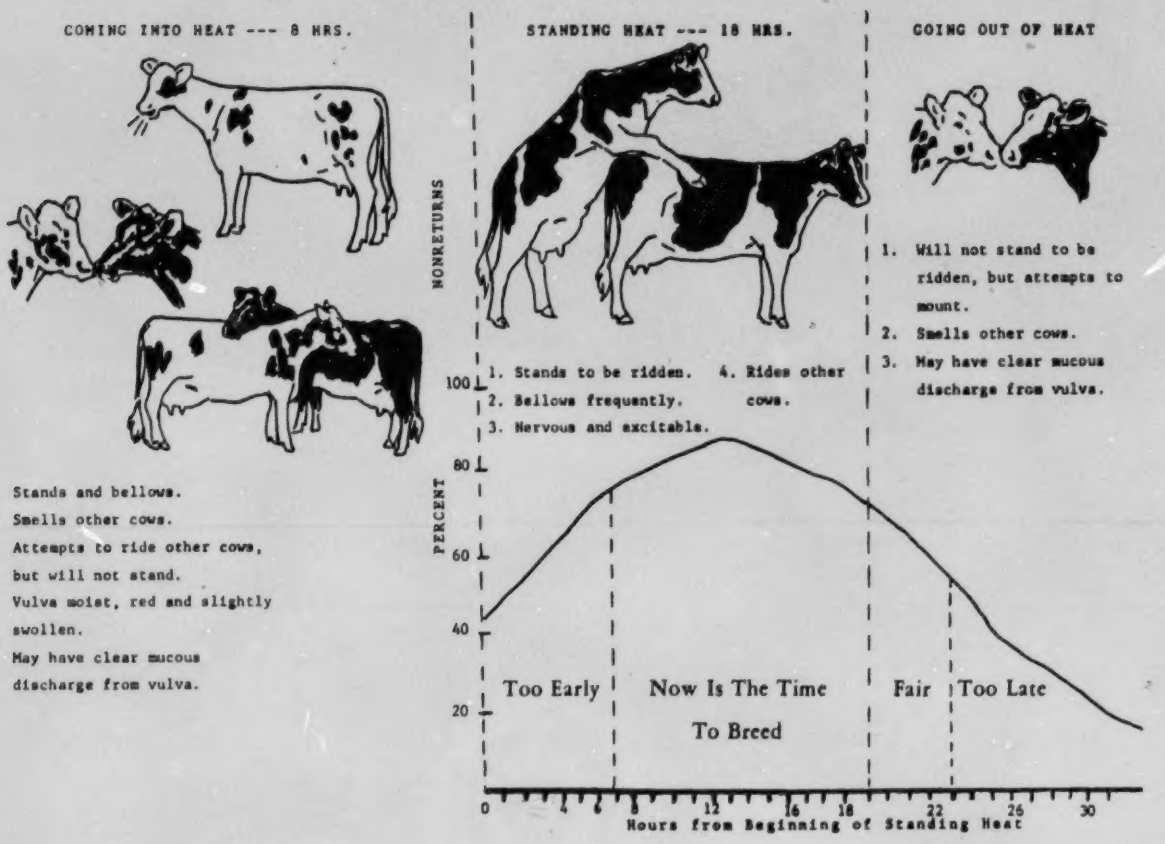
Breed	Body weight at breeding	Body weight at calving
Ayrshire	272-318 kg (600-700 lbs.)	432-477 kg (950-1050 lbs.)
Brown Swiss	341-409 kg (750-900 lbs.)	477-523 kg (1050-1150 lbs.)
Guernsey	250-295 kg (550-650 lbs.)	386-432 kg (850-950 lbs.)
Holstein	341-409 kg (750-900 lbs.)	477-523 kg (1050-1150 lbs.)
Jersey	227-273 kg (500-600 lbs.)	364-409 kg (800-900 lbs.)

4. Cows will come into heat 35-40 days after calving and again about 60 days after calving. Breed cows on the second heat since the uterus is more fully recovered from calving. (This depends on uterine infection or other stress or damage to uterus which hinders healing.)

   a. Uterine infections, poor condition, disease, and poor diet will delay timely breeding.

   b. Cows should be bred about 13 hours after the cow is seen in "standing heat". Refer to the chart below.

TIME TO BREED FOR BEST RESULTS



5. Have your veterinarian perform pregnancy checks.

6. Be present when cows are calving and do the following:

   a. Assist the cow if necessary and if you are capable of handling the problem. Call the veterinarian if in doubt.

   b. If the cow does not attend to the calf in the first few minutes after calving, remove the mucous membrane from the head so the breathing passages are clear. If the cow does not begin to lick the calf to stimulate circulation, you may also need to rub the calf dry with a burlap sack or rag.

c. Be sure that the calf has colostrum within an hour after birth.

d. Immediately after birth dip the calf's naval in tincture of iodine to prevent infection.

7. Check the placenta after birth to determine if it is complete and that part of it does not remain attached to the uterus. Have your veterinarian check all cows after calving to avoid infection.

8. Check the vagina for tears. Have your veterinarian stitch or suture a large tear.

9. Infuse the uterus with antibiotics after the cow has cleaned in order to prevent infection of the weakened or injured uterus.

10. For each cow, keep records of all health problems, the types of drugs received, and method of treatment.

- Milking Practices -

1. Milk on a regular schedule for quick milk let-down and higher production.

2. Wash and dry udders to stimulate milk let-down and prevent bacteria from entering the teat canal.

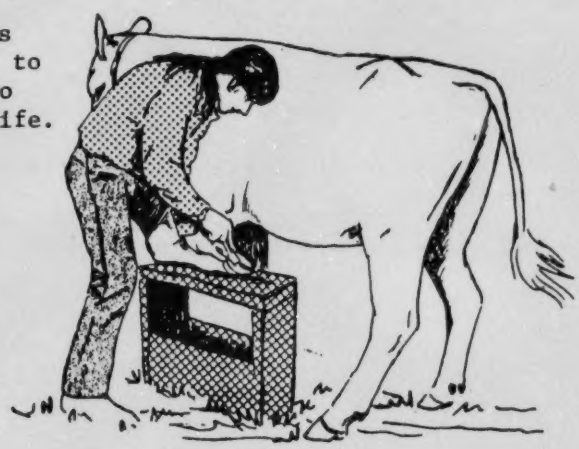
3. Strip cows (remove a little milk) before applying the milking machine for early detection of mastitis and to remove the milk high in bacteria.

4. Dip teats after milking with a recommended solution (dip) to prevent mastitis.

5. Dry treat cows at the end of their lactation to avoid mastitis upon freshening. Infuse each quarter with dry-treat antibiotics after thoroughly cleaning and disinfecting each teat to prevent injection of bacteria that may be on the teat.

- Cultural Practices -

1. Have hooves trimmed twice each year or as necessary to prevent injuries to the udder and lameness, and to extend the cow's productive life.



2. Dehorn all calves to prevent injuries and tone down the aggressive cattle in the pecking order. Use one of three methods in a fly-free season: caustic paste, electric irons, and cutting spoons or tubes.

3. Remove extra teats on calves with surgical scissors in a fly-free season to prevent their development as an outlet for mastitis.

4. If you have a problem with heifers sucking each others teats, put nose rings in heifers to prevent damage to the undeveloped udder and teats.

5. Clip hair on the udder and belly to keep the udder dry and clean. Hair may be clipped on the entire body to keep cows clean and to lessen parasite numbers.

- Purchasing Cattle -

1. Buy only healthy cattle, those which have been certified healthy by a veterinarian.

2. Buy cattle which have been vaccinated for shipping fever to prevent your herd from being infected with it and to insure that the cattle you purchased stay healthy.

3. Isolate from you herd all purchased cattle and those returning from fairs until you are sure they were not exposed to any infectious disease.

- Death of Cattle -

1. Have autopsies performed on all cattle that die from unknown causes. By determining if a pathogen caused the death, you can prevent the spread of infectious diseases to other cattle and can allow vaccination and early treatment of those already infected.

2. Remove and destroy the carcasses of dead animals to prevent infection of other animals.

- Work Closely With Your Veterinarian -

1. Set up a herd health program that includes parasite control, vaccination, pregnancy checks, examinations after calving, mastitis control and prevention, and other practices.

2. Follow the veterinarian's recommendations.

3. When you are unsure of the cause of a disease or your ability to treat it, call you veterinarian right away. Many diseases progress rapidly and can best be treated early, and at less expense.

PART III

IDENTIFYING AND TREATING DISEASES

UNIT 8 TREATING THE DISEASED ANIMAL

UNIT 8 VOCABULARY

diagnosis	(di ag no sis)	: identifying a disease from its signs or symptoms
dosage	(dos age)	: a measure or specific amount of medication
drenching	(drench ing)	: a large dose of medicine mixed with a liquid that is put down the animal's throat
intrauterine	(in tra uter ine)	: within the uterus
palpate	(pal pate)	: to examine by touch
precaution	(pre cau tion)	: to take care before; to prevent harm
prolapse	(pro lapse)	: the slipping of a body part from its usual position

- General Guidelines for Treating the Diseased Animal -

1. Make sure the animal is warm and comfortable.
2. Do not leave an animal on her side; prop her up to prevent bloat.
3. Consult your veterinarian for the correct diagnosis and treatment.
4. Isolate sick or injured cattle.
5. Provide fresh feed and water, and hand feed if necessary.
6. Keep the nasal passages clear.
7. Turn downed cows from side to side a few times each day.
8. If possible, remove the source of infection or stress.
9. Follow the veterinarian's directions.
10. Use specific drugs and follow dosage instructions and cautions. READ LABELS CAREFULLY !!!
11. Continue treatment for a long enough period to prevent the cow from having a relapse.
12. Guard against secondary infections.
13. Restrain or control cattle properly to avoid injuring yourself or the cow.

- Establishing a Medicine Chest -

1. Reasons for keeping one.
   a. to handle routine health problems and emergencies before the veterinarian arrives.
   b. to keep medication and equipment on hand to carry out management practices

2. Suggested medication
   a. to stop bleeding: silver nitrate
   b. to disinfect and clean: tincture of iodine, epsom salts, antiseptic solution and spray, copper sulfate
   c. to aid digestion: anti-scouring agent, anti-bloating agent, electrolyte solution

d. to treat milk-related problems: calcium dextrose, diuretic, mastitis treatment for producing and dry cows, udder balm

e. to control parasites: louse powder, fly spray, other insecticides

f. to meet other problems: petroleum jelly, general antibiotics such as penicillin, streptomycin, tetracyclin, and furacin

3. Suggested equipment

a. for restraint: rope, rope halters, nose leaders

b. for general health: large animal rectal thermometers, cotton, gauze, bandages, surgical scissors

c. for udder problems: teat dilators (a needle-like tube that is inserted into the teat), disposable teat cannulas (small tube that is inserted into the teat), udder balm

d. for administering medication: disposable syringes, balling gun, intravenous (in tra ve nous) tube, needles

e. for cleaning and flushing wounds: bulb syringe

f. for calving: calving chain with handles, calf bottle, liquid soap

g. for routine practices: dehorners, stomach magnets, hose for drenching, ear tagging equipment, castrating equipment, weight tapes, hoof trimming tools

4. Precautions when using medication

a. Consult your veterinarian before using any unfamiliar medicine or treatment.

b. Follow veterinarian's recommendations.

c. Read and follow directions on the label.

- Methods for Administering Medication -

1. Oral methods: placement into the body by way of the mouth. Precautions: keep your hands out of the mouth and away from the animal's teeth. Do not place medication in the animal's lungs.

a. drenching

b. use of a balling gun

2. Injection methods: placement into the body using a needle.

   a. subcutaneous injection (sub cu ta ne ous): injection just beneath the skin

   b. intramuscular injection (in tra mus cu lar): injection into the muscle. Place the needle into a muscle in the neck, shoulder, or hind quarter and slowly draw back the plunger. If blood appears, the needle is in a vein. Remove the needle and try again. After getting the needle in the desired location, slowly push in the plunger until all the fluid is injected. Remove the needle and gently rub the area to prevent the fluid from leaking out of the needle hole and to work the fluid into the muscle.

   c. intravenous injection (in tra ve nous): injection into a vein, often the jugular vein. Inject the fluid slowly to avoid heart failure. The fluid must be sterile.

   d. intraperitoneal injection (in tra per i to ne al): injection into the abdominal cavity or belly. A long needle is pierced through the animal's flank into the abdominal cavity by the veterinarian. Only sterile fluid is used.

3. Application of locals: drugs that are applied to a specific area by several methods.

   a. to the eyes, skin, or mouth by dousing, squirting, rubbing or dipping

   b. to the udder by teat infusion or injections. Milk out the quarter. Wash and disinfect the outside by swabbing the end of the teat with alcohol. Inject the drug and massage the quarter.

   c. to the uterus by intrauterine infusion. With warm, soapy water, wash the cow's exposed parts (the vulva and prolapsed parts and the operator's arms and hands. Guide the sterile tubes through the cervix by palpating through the rectum. Then inject fluid or insert a bolus (large pill).

- Precautions When Injecting Drugs -

1. Be sure to inject the correct drug at the proper dosage.

2. Do not mix drugs unless told to do so by your veterinarian.

3. Check the expiration date (the date the medicine is no longer good) and the storage requirements for the drugs you use.

4. Check the withdrawal period (the time it takes the medication to disappear from the body).

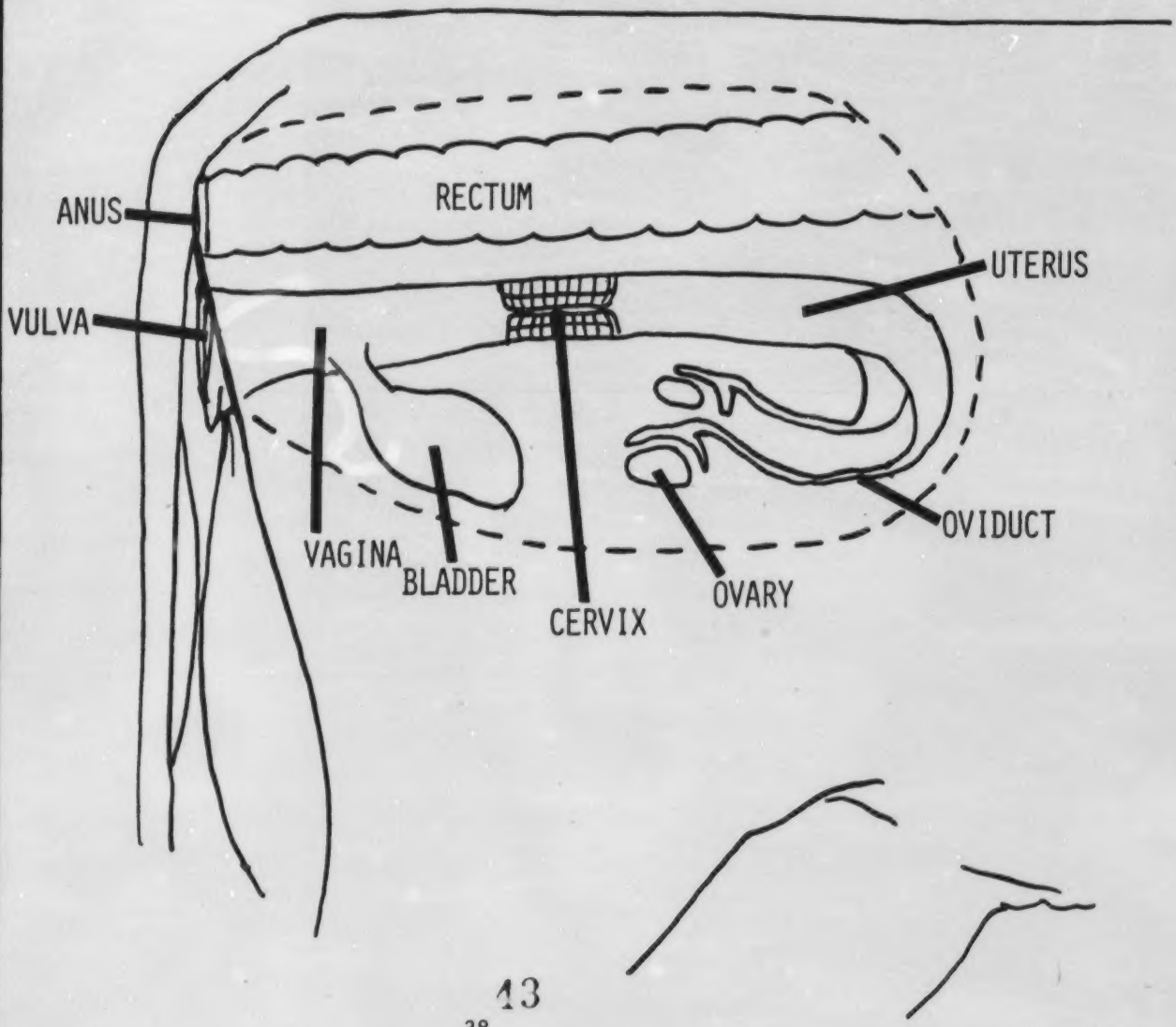
5. Sterilize the needle before using on a different animal.

6. Before injecting medicine, disinfect the animal's skin with alcohol.

7. Do not inject large air bubbles into the bloodstream; it could kill the animal.

8. Massage or rub the area after injection to be sure the medication remains there.

UNIT 9 REPRODUCTIVE DISEASES



UNIT 9 VOCABULARY

Caesarian section (Cae sar i an sec tion)	: removal of the calf by surgery
contaminated (con tam i nated)	: soiled, stained or infected by contact
cystic ovaries (cys tic ov a ries)	: cysts (lumps) on the ovaries that prevent normal egg production
economical (eco nom i cal)	: thrifty; careful use of resources (money), little waste
erratic (er rat ic)	: NOT regular, uniform, or consistent
estrogen (es tro gen)	: a female hormone which causes heat
fatigue (fa tigue)	: tired, weary, or exhausted
gestation (ges ta tion)	: the period of pregnancy; the length of time needed for the full development of the fetus
lesion (le sion)	: an injury or abnormal change in a body part due to disease
profuse (pro fuse)	: pouring forth freely; large amount of
reposition (re po si tion)	: to change the position of
secondary infection (sec ond ary in fec tion)	: a second infection that is present: one occurring after the body has already been weakened by another disease

NON-INFECTIOUS REPRODUCTIVE DISEASES

SILENT HEAT

No visible signs of heat or estrus

Dectection: No known detection method

Treatment:

1. Feed proper diet.
2. Check for proper minor (trace) minerals in the diet.
3. Consult your veterinarian, she/he may inject hormones or palpate.

Causes:

1. Low estrogen levels in the body
2. Pregnancy
3. Nursing
4. Cysts on ovaries
5. Pain, injury, disease, or fatigue
6. Poor diet; lack of iron, vitamins, or minerals
7. Parasites in large numbers

Prevention:

1. Have your veterinarian check your herd monthly for general health and pregnancy.
2. Feed a balanced ration.

Comments:

1. Heat periods are sometimes shorter in hot weather, while the estrous cycle is sometimes longer.
2. Feeding or working around cattle sometimes prevents them from showing heat. Check cows before feeding and after milking.
3. Watch cows closely and carefully. Use commercial heat detection methods (see page 14) and keep careful breeding records. Management, balanced rations, and regular veterinarian check-ups are also key factors in making sure milk production and the calf crop will be high.

DIFFICULT BIRTH

Detection:

1. Cow has been in labor and straining for 1½ hours or longer.
2. One fore leg or hind leg of the calf extends from the vulva for over an hour.
3. Cow fails to show signs of calving, after due date.
4. Calf is partially out, but the cow cannot expel it.

Treatment:

1. Call your veterinarian when you suspect calving problems. Only an experienced person should try to reposition or pull a calf.
2. Reposition calf by pushing it back into the cow when she is not straining and then turn or position the calf by hand. Be careful not to injure the cow.
3. Use calving chains.
4. Caesarian (cae sar i an) section by veterinarian, surgery to remove calf.
5. Veterinarian removal of the calf in parts (dismemberment).

Cause:

1. Calf is not in the correct position.
2. Cow is not large enough to deliver the calf. It may be an unusually large calf or the cow may have been bred at an early age or when underweight.

Prevention:

1. Feed heifers a balanced ration before and after breeding so they can develop a large skeletal frame before calving.
2. Breed heifers to bulls who are known to sire smaller calves.
3. Cull cows that continue to have calving problems.

TWINNING

Giving birth to twins

Detection:

1. Drop in milk production the last three months of lactation.
2. Calving problems
3. Detection by veterinarian

Treatment:

1. Treat for stress: feed higher protein levels.
2. Treat for secondary disorders; call your veterinarian for advice.

Causes:

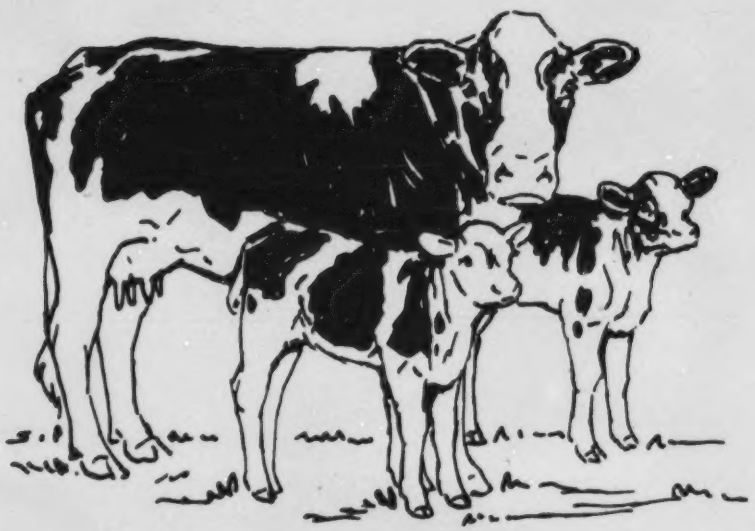
1. Cystic ovaries
2. Cow bred too soon after calving
3. Heredity (Some cow families have higher rates of twinning.)

Prevention:

1. Cull cows that twin or have a family history of twinning.
2. Do not raise twins.
3. Use bulls with clean family histories (no twins).

Comments:

1. Twinning is undesirable because twins are often weak at birth and more likely to die, milk produciton is reduced, and a heifer calf born with a bull twin is sterile (called a free-martin).
2. Abortion is more likely when giving birth to twins.



RETAINED PLACENTA (re tained pla cen ta)

Part or all of the after birth remains within the cow 12 hours after calving.

Detection:

1. Part of the placenta hangs from the vulva
2. Red or brown, foul-smelling fluid flows from the vulva
3. Milk production drops; the cow is off-feed, listless, and may have a fever

Treatment:

1. A veterinarian should be called to begin treatment (such as placing antibiotics in the uterus, detaching the placenta from the uterus by hand, and/or injecting hormones).
2. Have your veterinarian re-examine the cow 20 - 40 days after calving.
3. Postpone breeding for 90 - 120 days to let cow recover if necessary.

Causes:

1. Placenta cotyledons (cot y le don) do not detach from the uterine caruncles (ca run cle)
2. Uterine infection
3. Poor diet - low levels of vitamins A,E, or minerals (selenium)
4. Abortion in late pregnancy
5. Twinning
6. Calving before due or trouble at calving

Prevention:

1. Sanitation in breeding and calving
2. Feeding a balanced ration

Comments:

1. A cow that has retained her placenta is four times more likely to do so again.

ABORTION (abor tion)

The fetus being expelled before the pregnancy term is completed; miscarriage

Detection:

1. Fetus (the developing calf) and placenta is seen
2. Blood or pus flowing from the vulva
3. Sudden increase in milk production part way through gestation (ges ta tion)
4. Heat occurs after pregnancy has been confirmed

Treatment:

1. Call your veterinarian at once

Causes:

1. Injury, many different diseases, fatigue, shock from surgery
2. Poisons, plants, and some drugs and chemicals
3. Infection

Prevention:

1. Remove the aborted material at once to prevent spreading of the disease.
2. Do not let other cows touch aborted material or the area surrounding it. Sanitize or disinfect anything touched by the aborted material.
3. Isolate the cow.
4. Feed a balanced ration.
5. Remove sources of injury.
6. Check with your veterinarian for other measures.

Comments:

1. Put the aborted material into a plastic garbage bag and save it for the veterinarian to examine and test.
2. Abortion can be caused by many diseases which spread rapidly to other cattle; be careful.

INFECTIOUS REPRODUCTIVE DISEASES

Diseases which spread rapidly

BACTERIAL INFECTIONS

Infections caused by bacteria

Detection:

1. Swollen, sore, and red vagina and vulva
2. Swollen and irritated testes
3. Positive lab and blood tests
4. Abortion after fifth month of pregnancy
5. Repeated breeding

Treatment:

1. Depends on the type of infection; call your veterinarian for correct diagnosis and treatment.

Causes:

1. Contact with infected cows or bulls through mating and touching skin, mucous membranes, urine, or manure
2. Eating contaminated feed, water, or milk

Prevention:

1. Vaccinate young stock.
2. Use good sanitation practices. Handle feed and manure separately.
3. Use artificial insemination (A.I.) - with disease free semen.
4. Separate and treat infected cattle.
5. Test herd and infected cattle.

Comments:

1. Fewer calves, reduced milk production, and the loss of mature cattle result in a loss of income.

BRUCELLOSIS (Bru cel lo sis)

Bang's Disease

Detection:

1. Abortion
2. Retained placenta
3. Cow will not settle, is infertile
4. Positive blood test, milk ring test, and other lab tests

Treatment:

1. No known economical treatment

Causes:

1. A bacteria: *Brucella abortus*
2. Infection through the skin and mucous membrances
3. Eating or contact with vaginal flow, aborted tissue, milk, blood, manure, and/or semen of infected cattle and anything these materials have contaminated

Prevention: All of the following preventative measures must be followed to be effective:

1. Strict sanitation
2. Vaccination of calves
3. Isolation of new cattle
4. Testing of herd according to test program
5. Isolation then slaughter of infected animals; destroy carcass and any feed or other materials that has been infected.

Comments:

1. Brucellosis is called Undulant Fever in humans. Humans are infected by drinking unpasteurized (un pas teur ized) milk that is infected, handling infected carcasses, and by direct contact with infected cattle.
2. Cooperation with the veterinarian and state health board is required.
3. Brucellosis tests are required for all cattle shown at New York State fairs.

VIBRIOSIS (vib ri o sis)

Detection:

1. Abortion between the fourth and seventh months of pregnancy
2. Retained placenta
3. Abnormal estrous cycle
4. Repeated breedings required
5. Detection in bulls only by testing

Treatment:

1. After an infected cow has an abortion, give it a three month rest before rebreeding.
2. Call your veterinarian; he/she will likely place antibiotics in the uterus.

Causes:

1. A bacteria: *Vibrio fetus*
2. Natural breeding with infected cattle

Prevention:

1. Use only bulls that have been proven healthy and/or use A.I.
2. Cows will develop immunity about 3 months after aborting; rebreed then.
3. Vaccinate cattle.

Comments: Antibiotics are added to semen used in artificial insemination; thus, if the inseminator practices strict sanitation, the disease cannot be spread by A.I.

LEPTOSPIROSIS (lep to spi ro sis)

Detection:

1. High fever
2. Listless, loss of appetite with drop in milk production
3. Yellow, brown or bloody milk
4. Ropy or stringy milk
5. Bloody urine
6. Anemia (lack of iron in the blood)
7. Abortion occurring at any time, but most often during the last third of pregnancy. (Cows usually abort one to five weeks after being infected.)

Treatment:

1. Call your veterinarian for correct diagnosis and treatment

Causes:

1. A number of closely related bacteria: *Leptospira pomona*
2. Direct contact of mucous membranes with contaminated water or urine
3. Breeding infected cattle
4. Contact with a swine carrier

Prevention:

1. Vaccinate every 6 to 12 months where leptospirosis is a problem.
2. Keep cattle away from stagnant water where bacteria thrive.

3. Find and destroy carriers, such as rats and other rodents.
4. Keep cattle away from swine.
5. Buy replacement stock from clean herds.
6. Test and isolate new and suspect animals.
7. Prevent spreading by isolating infected cattle and destroying their milk, bedding, aborted fetus and material, and carcass.

Comments:

1. Unlike the retained placenta in brucellosis and vibriosis, the placenta is quickly expelled in leptospirosis.

TRICHOMONIASIS (trich o mo ni a sis)

Detection:

1. Repeated breeding and long erratic estrous cycles
2. Abortion in the third to fifth month of pregnancy
3. Pus and fluid flow from the vagina during the first half of pregnancy

Treatment:

1. Cows should not be bred as long as there is a pus or fluid flow from the vulva. Cows can develop immunity and may be bred 1 or 2 months after the flow stops.
2. There is no successful treatment for bulls.

Causes:

1. A protozoan: *Trichomoniasis fetus*
2. Natural breeding with infected cattle
3. Infected semen

Prevention:

1. Use A.I. and semen from healthy bulls.
2. Slaughter infected bulls.

Comments:

1. Monthly veterinarian check-ups and breeding records keep the farmer aware of health problems.

MYCOTIC ABORTION (my cot ic)

Detection:

1. Abortion in the final months of pregnancy (Fetus has ringworm-like lesions and cotyledons have decayed.)
2. Lab tests

Treatment

No successful treatment is known.

Causes:

1. A fungus: *Aspergillus* or *Mucor*
2. Inhaling spores in moldy hay or straw

Prevention

1. Cure hay properly. Avoid molding of hay by treating it with a fungicide if necessary. Do not feed moldy hay to pregnant cattle.

Comments:

Mycotic abortion is often unexpected and therefore hard to control.

VIRAL INFECTIONS

Infections spread by a virus

IBR - RED NOSE

Detection:

1. Very high temperature when infected
2. Runny nose, with clear or bloody mucus that later hangs in strands and is filled with pus
3. Red crusted nose ('red nose')
4. Listless, loss of appetite and weight
5. Drooling
6. Labored breathing
7. Eyes water and later ooze with pus, may be red and sore
8. Pus flow from vulva
9. Abortion occurs 3 to 5 weeks after infection
10. Diarrhea
11. Death

Treatment:

1. There is no specific treatment; most cattle recover in 2 weeks.
2. Cattle should not be bred while IBR is in the herd.
3. Follow veterinarian's advice in treating secondary infection.

Causes:

1. A virus: *Herpes bovis*
2. Natural breeding of infected cattle
3. Using contaminated equipment on cattle

Prevention:

1. Vaccinate under veterinarian's direction; DO NOT vaccinate pregnant cows.
2. Live vaccine may be used on open cows before breeding and on 6 to 8 month old heifers. Vaccine protection lasts for 3 years against severe infection.

Comments:

1. Signs of infection begin to show 10 - 14 days after the virus enters the body.
2. Cattle that recover may be carriers.
3. Death loss is usually less than 5%.

PARAINFLUEZA - 3, PI-3 (para in flu en za)

Detection:

1. High temperature at outset
2. Runny nose, watery discharge with red nasal linings
3. Coughing with increased heart and respiration rates
4. Watery, red, sore eyes
5. Listless with loss of appetite and weight
6. Abortion

Treatment: There is no effective treatment; however, it is recommended that you isolate infected cattle and use antibiotics to help control any secondary infection.

Cause:

1. A virus: *Bovine myxovirus*
2. Contact with infected cattle

Prevention:

1. Vaccinate herd.
2. Isolate infected and new cattle.
3. Contact your veterinarian for other suggestions.

Comments: PI-3 is also a severe respiratory disease with symptoms like those of IBR, BVD, and MD. It can occur at the same time as those infections or with secondary infections.

BOVINE VIRUS DIARRHEA - BVD and MUCOSAL DISEASE COMPLEX - MD

MD has the same symptoms as BVD but causes more deaths.

Detection:

1. Listless, loss of appetite and weight
2. Mild bloat
3. High temperature for one to two days which may drop to normal or below normal and rise again when diarrhea starts
4. Increased heart and respiration rates
5. Profuse watery diarrhea that may be bloody, contain mucus, and have a foul odor
6. Cow tries to urinate and/or defecate but cannot
7. Severe and rapid loss of body water
8. Lesions inside the mouth, on the tongue, and on the gums
9. Lameness
10. Abortion and birth defects of calves
11. Death

Treatment: There is no effective treatment but is recommended that infected cattle be isolated and secondary infection be treated with antibiotics as suggested by your veterinarian.

Cause:

1. A virus; strains of myxovirus
2. Direct contact with infected cattle or indirectly by human carriers

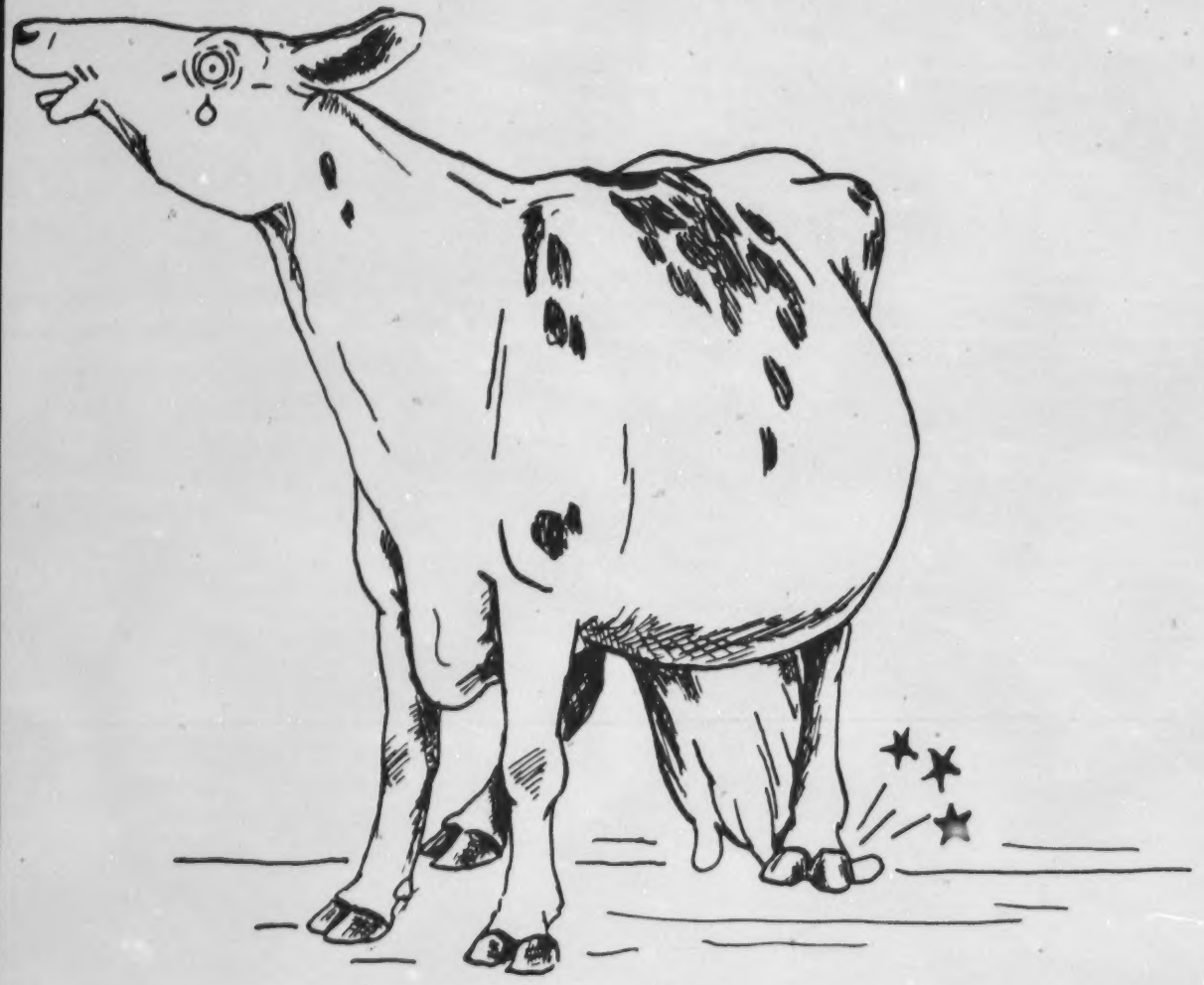
Prevention:

1. Vaccinate under direction of a veterinarian; DO NOT vaccinate pregnant cows.
2. Isolate infected cattle.
3. Isolate new cattle for 30 days.

Comments:

1. MD and BVD are caused by the same virus. Cattle with BVD may lose their appetite and have mild diarrhea for 2 to 4 days and then recover. Cattle with MD often die within 2 to 3 days, suffering from severe diarrhea, body water loss, and other symptoms.
2. Modified live virus vaccine is suggested for 6 month old calves; however, it may trigger the disease.

UNIT 10 MAMMARY DISEASES



UNIT 10 VOCABULARY

antiseptic	(an ti sep tic)	: a substance that controls or inhibits the growth of microorganisms
compress	(com press)	: a pad or cloth that is applied with pressure to the body, often containing medication
congested	(con ges ted)	: a build-up of blood or body fluids in part of the body
diuretics	(di uret ics)	: medication that increases urination to remove excess fluids from the body
hygiene	(hy giene)	: cleanliness; methods of preventing disease, preserving health
inflammation	(in flam ma tion)	: swollen, red, sore; a means by which the body removes damaged tissue and poisons
inherited	(in her i ted)	: characteristics received from ancestors genetically
pendulous	(pen du lous)	: hanging freely without a good attachment, swinging; ligaments which hold the organ have broken down
recurring	(re cur ring)	: happening again

MASTITIS (mas ti tis)

Inflammation of udder tissue from injury or infection

Detection:

1. One or more swollen, red, hard, or painful quarters
2. Reduced milk flow and production
3. Change in the appearance and composition of milk
   a. Slightly watery with a few flecks
   b. Watery with large yellow clots
   c. Watery, brown or bloody with fine flakes
   d. Watery with white strings
4. Fever, rapid pulse, change in hair coat, lack of appetite, weakness
5. Large number of white blood cells in the milk as shown by the California Mastitis Test (CMT)

Treatment:

1. Treat for specific symptoms and causes; check with your veterinarian.
2. Milk out affected quarter often.
3. Treat teat wounds
   a. Soak and clean with mild antiseptic.
   b. Use a local pain reliever during milking.
   c. Tape small gaping wounds. Have veterinarian suture larger, deeper cuts soon after they occur.

Causes:

1. Over 25 types of bacteria
2. Mechanical: vacuum problems, or poor fitting or cracked teat cups in the milking units
3. Sanitation and management: using one udder cloth on several cows, dirty equipment and hands, and failure to dip teats and use disinfectants
4. Teat injuries and sores

Prevention:

1. Sanitation
   a. Sanitize equipment before milking.
   b. Wash and dry udder before milking.
   c. Use a paper towel for each cow.

MASTITIS - continued

d. Dip teats in a sanitizing solution after removing milker.

e. Clean equipment after use.

2. Milking units

a. Check vacuum pressure and lines often.

b. Clean and replace rubber inflations and other wearable parts as needed.

3. Prevent teat wounds

a. Check cow areas and remove harmful objects.

b. Trim hoofs and dewclaws as needed.

c. Cull cows with pendulous udders.

4. Cull cows with recurring mastitis.

Comments: Depending on the type and form of mastitis medication, milk may not be used for up to 96 hours after treatment.

UDDER EDEMA (ud der edema)

A congested, swollen condition of the udder before or after calving

Detection:

1. Fluid build-up and swelling of the udder and sometimes stomach floor a few days to a few weeks before calving
2. Swelling from brisket to naval, may be present a few weeks after calving

Treatment:

1. Milk frequently.
2. Lightly rub or massage the udder and apply hot then cold packs.
3. Apply linament.
4. Use diuretics as recommended and directed by veterinarian.

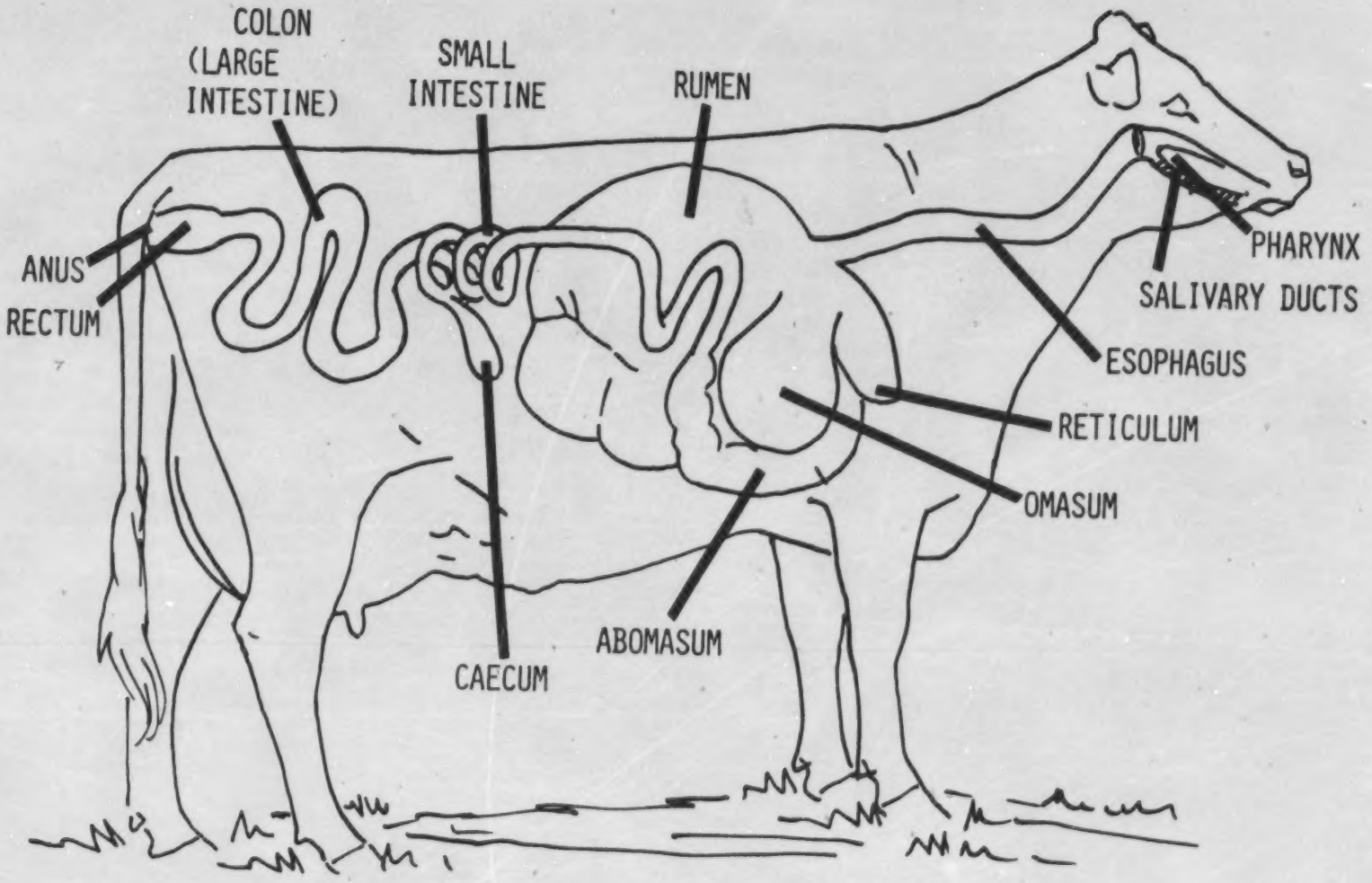
Causes: Body fluid collects under the skin and is prevented from being carried away by the blood system.

Prevention: Udder edema seems to be an inherited tendency, so selection of the breeding stock is important. No other form of prevention is known.

Comments:

1. Milking the cow before calving usually IS NOT helpful.
2. Edema is likely to increase udder and teat injury.
3. Udders are likely to become pendulous as the ligaments break away under the extra weight of fluid.
4. Edema usually occurs in first and second calf heifers and in high producers.

UNIT 11 DIGESTIVE DISEASES



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UNIT 11 VOCABULARY

contractions	(con trac tions)	: the drawing up and thickening of a muscle in work; motion of the uterus in expelling the fetus
defecate	(def e cate)	: to excrete manure, feces
defoaming agent	(de foam ing)	: a chemical which breaks up foam
gaunt		: thin, bony, without much flesh
ketone body	(ke tone)	: an acid that is usually found in the body, but is found in large amounts when some diseases are present
laxative	(lax a tive)	: to relieve constipation, loosen the bowels
penetration	(pen e tra tion)	: the depth to which something enters; entering into
stethoscope	(stetho scope)	: an instrument used to listen to body sounds
urinate	(ur i nate)	: to release urine from the body, pass water

INDIGESTION (in di ges tion)

A minor disorder of the stomach and intestines ofen caused by feed, too much grain, or overfeeding

Detection:

1. Loss of appetite and drop in milk production
2. Bloated
3. Soft, foul smelling manure
4. Reduced amounts of manure

Treatment:

1. Correct the suspected cause (diet)
2. Using a stomach tube, place 20-40 liters (5-10 gallons) of warm water in the rumen. Then knead the left side of the cow to start rumen movement.
3. Call your veterinarian if high-energy feeds, urea, or high-protein feeds were eaten in excess, and treat as directed.
4. The cud from a healthy cow can be given to a sick cow to start bacterial action in the rumen.

Causes:

1. Eating too much of any feed
2. Eating spoiled feeds, frozen feeds, or lush cereal pasture
3. Urea suddenly added to the ration
4. Changing to high level grain ration
5. Eating placenta

Prevention:

1. Make changes in rations slowly to allow the needed type of bacteria to develop in the rumen.
2. Use clean, unspoiled, fresh feeds.
3. Limit the amount of time cows are allowed to graze lush pastures, and feed hay before pasturing.
4. Remove placenta after cow calves.

Comments: The digestive system is often affected when disease is present. Any change in appetite, feeding habits or in the manure or urine should be noted and the cow should be checked for other symptoms.

BLOAT

Large amounts of gas collecting in the rumen and reticulum

Detection:

1. Swelling or bulging of the sides, especially the left side
2. Labored breathing
3. Drooling
4. Loss of appetite
5. Pain
6. As bloat becomes severe belching stops, the cow cannot chew her cud, the mucous linings turn blue, and the cow staggers and falls with her legs extended. Death occurs within a few minutes.

Treatment:

1. Relieve pressure in the rumen as quickly as possible by:
   a. Passing a stomach tube or rubber hose into the rumen
   b. Placing a defoaming agent such as peanut, corn, or soybean oil in the stomach

   Use a trocar and cannula only if the cow appears to be dying.
2. For mild bloat, place the cow on an incline with her front feet higher than her hind feet.

Causes:

1. Sudden change to lush or legume pasture
2. Object caught in the food passages
3. Plants that cause a foam to develop in the rumen that is difficult to breakdown and prevents belching
4. Failure to belch
5. Diseases which cause cows to go down (Once the cow is down it is likely to bloat.)

Prevention:

1. Keep pastures at 50% or less legume plants.
2. Strip graze.
3. Feed coarse hay before pasturing on legume rich or Sudan pastures.
4. Give non-poisonous oils by spraying on pasture, mixing with drinking water, or drenching. Provide bloat blocks for cattle to lick in pastures.

Comments: Prevention is not always successful.

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DISPLACED ABOMASUM (dis placed ab oma sum)

Twisted stomach; the movement of the abomasum from the left side of the rumen (its usual place) to the right side of the rumen

Detection:

1. Loss of appetite and weight with drop in milk production
2. Cow has dull, gaunt look with an arched back
3. Light-colored manure covered with mucus (less manure than normal and diarrhea may occur).
4. Fullness in the left flank
5. Veterinarian detection with a stethoscope

Treatment:

1. Roll cow on her back, then back and forth from left to right. This may move the abomasum back into place.
2. Reduce feed intake; feed only dry roughages.
3. Since the abomasum is likely to become displaced again, have the veterinarian suture the abomasal wall to the body wall.

Causes:

1. The specific cause is not known; however, there seem to be many factors.
   a. Decrease in abomasum muscle tone
   b. Low-roughage, high-grain, or corn silage rations
   c. Enlargement of the uterus in late pregnancy
   d. Shrinking of the rumen (because of appetite loss from another disease) may add to the problem

Prevention: There is no known preventative measure; however, it is recommended that at least one half of the dry matter be fed as roughage.

Comments:

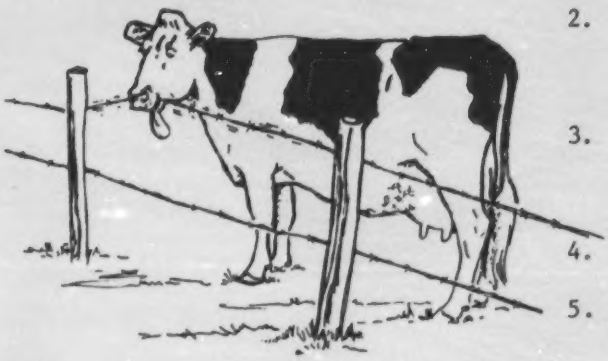
1. Feed intake and milk production will return to normal quickly if cow is <u>treated early</u>.
2. Feeding all corn silage seems to add to the problem.

HARDWARE DISEASE

Piercing the reticulum and sometimes the rumen by a sharp object

Detection:

1. Complete loss of appetite and a sudden drop in milk production



2. Cow stands with an arched back and refuses to walk. If forced to walk, she will walk with a slow, careful gait.
3. Cow groans when forced to move suddenly or when defecating, urinating or lying down.
4. Slightly above normal temperature.
5. Higher than normal pulse rate with shallow and rapid breathing.

Treatment:

1. Call your veterinarian to remove the object and treat for infection.
2. Place a magnet in the cow's stomach.
3. Keep the cow still for one or two weeks with her head and front end higher than her rear end.
4. Feed cow less to avoid pressure.
5. Use a mild laxative under veterinarian's direction.
6. Prompt treatment is very important.

Causes:

1. Swallowed objects (nails, wire, glass) pierce the wall of the rumen or reticulum
2. Contractions during calving and rugged exercise may cause the piercing

Prevention:

1. Keep sharp objects away from cattle.
2. Place cattle magnets in the reticulum with a balling gun to pick up iron objects (give magnets to all heifers).

Comments:

1. Secondary infections often occur when the hardware moves through the stomach wall, spilling the stomach contents and piercing other tissues.
2. Death may occur suddenly if the heart or lungs are pierced.

JOHNE'S DISEASE - PARATUBERCULOSIS (para tu ber cu lo sis)

Detection:

1. Foul-smelling diarrhea, sometimes recurring for months
2. Loss of flesh; gaunt, dull appearance over a period of time
3. Above normal temperature
4. Drop in milk production
5. Lab tests on manure samples
6. Upon death, autopsy shows thickened intestine wall
7. Symptoms generally seen shortly after calving

Treatment: There is no effective treatment.

Cause:

1. A bacterium: *Mycobacterium paratuberculosis* (Johne's bacillus)
2. Bringing an infected animal into the herd
3. Humans carrying the bacterium on their shoes (manure)
4. Breeding infected cattle
5. Contaminated feed

Prevention:

1. Buy only clean cattle.
2. Isolate and slaughter infected cattle.
3. Do not breed cattle while infected cattle remain in the herd.
4. Avoid contamination of feed and feeding equipment: use strict sanitation.
5. Remove manure regularly and keep away from cattle.

Comments: Most state governments will pay farmers for the loss of cattle.

OTHER DISEASES AFFECTING THE DIGESTIVE SYSTEM WITH SYMPTOMS OF DIARRHEA:

	See pages:
BOVINE VIRUS DIARRHEA - BVD	52
IBR - RED NOSE	50
SHIPPING FEVER	69
STOMACH WORMS	93

UNIT 12 RESPIRATORY DISEASES

UNIT 12 VOCABULARY

antiserum (an ti se rum) : the fluid part of the blood taken from an animal which has built up resistance to a disease (has antibodies) and injected into another animal to prevent disease

BCG : a vaccine for humans against tuberculosis

chemotherapy (che mo ther a py): treatment of infection by doses of chemicals

constipation (con sti pa tion) : inability to defecate

lesions (le sion) : an injury or abnormal change in body part due to disease

listless (list less) : sluggish, indifferent to surroundings, dopey

recurring (re cur ring) : happening again

replacements (re place ment) : an animal taking the place of another

resistance (re sis tance) : the ability of an animal to ward off disease

stress : strain, pressure, events which cause a nervous reaction by the body

unpasteurized (un pas teur ized) : not been sterilized of harmful bacteria

vaccinate (vac ci nate) : to give an injection of a vaccine to lessen the effect of a disease

vertebrate (ver te brate) : having a backbone, spinal column

RESPIRATORY DISEASES (re spi ra to ry)

Those diseases affecting the lungs and their nerves, blood supply, and air passages

PNEUMONIA (pneu mo nia)

Swollen lung tissue with the air sacs often filling with fluid

Detection:

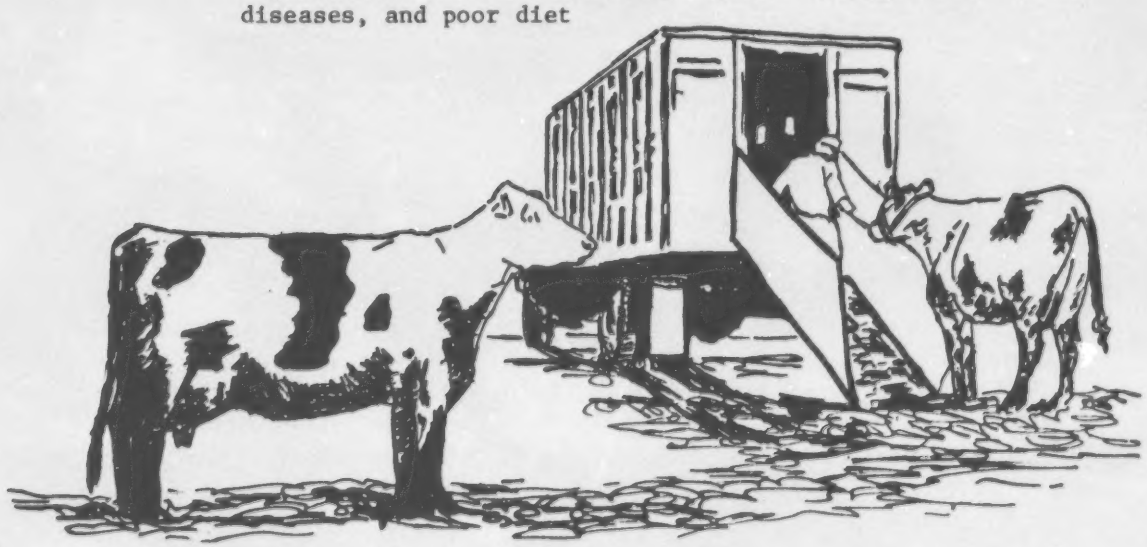
1. Rapid and labored breathing
2. Coughing
3. Runny nose with much mucus, often containing pus and blood
4. High temperature: 41 - 42.5° C (105 - 108° F)
5. More rapid pulse
6. Noise from lungs: murmuring, rattling, or cracking

Treatment:

1. Early treatment is important to prevent a long, recurring infection.
2. Call your veterinarian.
3. Give antibiotics under veterinarian's direction.

Cause:

1. Bacteria, viruses, microorganisms, parasites, and foreign matter
2. Stress: marked changes in temperature, change in housing, damp, drafty, or poorly ventilated housing, shipping, over-exertion, exposure to dust and bacteria, loss of strength from other diseases, and poor diet



PNEUMONIA - continued

Prevention:

1. Avoid stress which weakens the body to infection.
2. Buy healthy replacement stock and isolate them from herd.
3. Isolate and treat sick cattle.
4. Keep humidity low and the barn cool and properly ventilated.
5. Provide a balanced ration and fresh, clean water.
6. Bed cattle well.
7. Provide enough space for cattle; don't overcrowd.

Comments:

1. Pneumonia is a management-related disease. It often occurs as a secondary infection due to stress.
2. There are five common forms of pneumonia:
   a. bronchial, the most common
   b. inhalation, from breathing foreign matter into the lungs
   c. parasitic, from larva in the lungs (see page 95).
   d. purulent, pus filled lungs, often from hardware disease
   e. mycotic, from fungi or yeast entering the lungs
3. The form of pneumonia affects the type of treatment.

SHIPPING FEVER

Virus invade the bloodstream, mainly affecting the lungs

Detection:

1. Sudden fever 41 - 42° C (106 - 107° F)
2. Swollen throat
3. Rapid and labored breathing
4. Runny nose; at first mucus-filled and later pus-filled
5. Listless, loss of appetite and weight
6. Constipation or diarrhea
7. Milk production drops
8. Many symptoms similar to those of BVD, IBR, PI-3, tuberculosis. and pneumonia. Any of these diseases may occur with shipping fever.

Treatment:

1. Call your veterinarian and treat as directed.
2. Vaccinate with antiserum.
3. Watch infected and stressed cattle closely.

Cause:

1. A virus: the PI-3 virus may be the cause.
2. A bacterium: *Pasteurella* is also involved.
3. Stress: shipping in wet and cold weather, sudden changes in the temperature, overcrowding, poor housing (drafty or poorly ventilated), or poor diet
4. Contact with infected cattle and feed, especially new cows from auctions, or those returning from fairs.

Prevention:

1. Avoid long stretches between feeding or watering.
2. Avoid sudden changes in feed.
3. Avoid long stretches of shipping, and vaccinate before shipping.
4. Give cattle plenty of room in dry, draft-free, well-ventilated quarters.
5. Provide shelter.
6. Isolate new cattle and those returning from fairs.
7. Give special attention to cattle under stress.

Comments: Cattle exhibited at New York State fairs must be vaccinated for shipping fever (don't reply on vaccine for 100% protection).

TUBERCULOSIS - TB (tu ber cu lo sis)

Caused by a bacterium which mainly affects the lungs and is easily passed on from humans, cattle, and other vertebrates

Detection:

1. Hacking cough
2. Weak cattle with appetite and weight loss. (The muscles begin to waste away even though the cattle are well fed and cared for.)
3. Slight wavering temperature
4. Upon death, an autopsy shows lesions in the chest and lymph nodes of the head and intestines as well as in other organs.

Treatment: There is no effective treatment for cattle

Cause:

1. A bacterium: *Tubercle bacillo*
2. Contact with infected humans or other vertebrates
3. Contact with infected air, dust particles, feed water, unpasteurized milk, or manure

Prevention:

1. Test, isolate, and then slaughter all infected cattle.
2. Isolate and vaccinate all cattle that have been exposed to infected cattle.

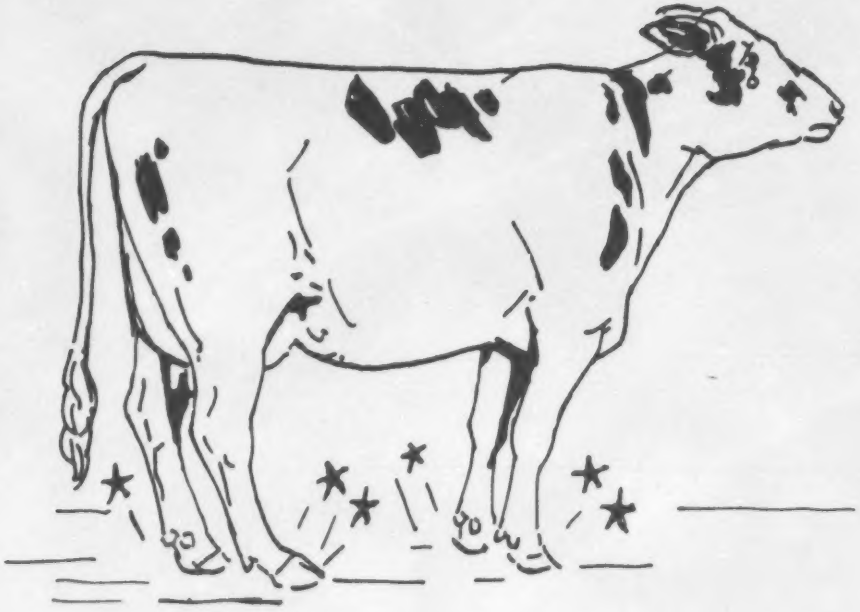
Comments:

1. A cash payment is made by the government to those farmers who lose cattle through the test and slaughter program.
2. BCG vaccine is successful in humans, but only reduces the severity of TB in cattle. Vaccinated cattle also react positively to testing.

OTHER DISEASES THAT AFFECT THE RESPIRATORY SYSTEM:

	see pages:
IBR - RED NOSE	50
LUNGWORM	96
PI-3	51

UNIT 13 STRUCTURAL DISEASES



UNIT 13 VOCABULARY

encrusted	(en crus ted)	: to cover with a crust or hard outer layer
puncture	(punc ture)	: to pierce with a sharp point, stab
resistance	(re sis tance)	: the ability of the body to ward off disease
stance		: the way an animal stands, the position of its feet

FOOT ROT

Infected tissue within and around the hoof

Detection:

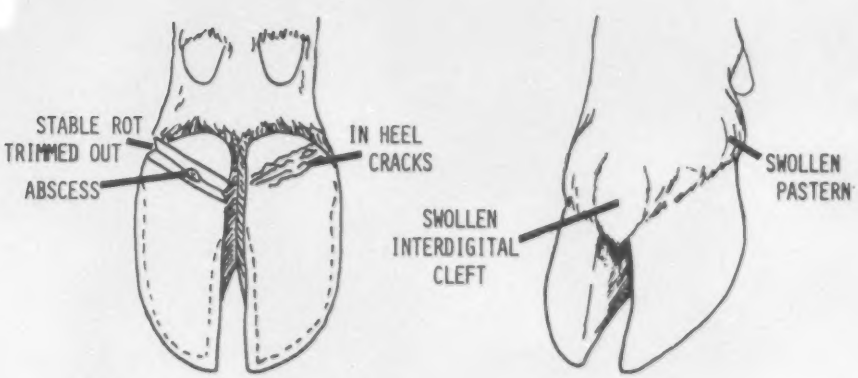
1. Lame, a change in normal stance, slowed movement, or an unwillingness to move
2. Decaying tissue between the toes and around the hoof
3. Swollen, crusty tissue between the toes and/or declaw
4. Foul smell about the hoof
5. Drop in milk production
6. Fever and appetite and weight loss if the infection is not treated

Treatment:

1. Keep the animal confined to a clean, dry pen.
2. Clean and trim the affected hoof.
3. Call your veterinarian for specific treatment: spraying or painting copper sulfate on the wound or soaking the entire hoof may be helpful. The hoof also may be bandaged to aid in healing and to prevent further infection. Antibiotics may also be prescribed.

Cause:

1. Bacteria
2. Break in the skin or horn of the hoof
3. Constant walking or standing in mud or manure
4. Sharp objects that injure the hoof



FOOT ROT - continued

Prevention:

1. Trim hooves regularly, as needed.
2. Remove or keep cattle away from harmful objects and wet muddy areas.
3. Use a 2 - 5% copper sulfate foot bath or slaked lime foot dip.
4. Use plenty of bedding to keep cattle dry and avoid injury.

Comments: When the foul odor of foot rot is not present, lameness is likely caused by a sole puncture.

SOLE PUNCTURES (punc ture)

A foot injury caused by stepping on a sharp object

Detection:

1. Lameness, swelling, unwilling to move
2. Loss of appetite and weight with drop in milk production
3. Awkward stance with cocked ankle
4. Tender area on sole or toe
5. Crack, puncture, or discolored area on the hoof (Punctures may be filled with dirt, pus, or dried blood.)

Treatment:

1. Apply pressure or peel away part of the hoof with a knife to find the affected area.
2. Trim mainly on the hoof's affected side so the weight will be borne on the healthy side of the hoof.
3. Clean the infected area and apply medication as directed by your veterinarian. Apply bandage to help healing and to prevent further infection.
4. Keep the cow in a dry, well-bedded stall.

Cause: Sharp stones or other objects that pierce the sole of the hoof

Prevention:

1. Trim hooves regularly.
2. Remove or keep cattle away from harmful objects.

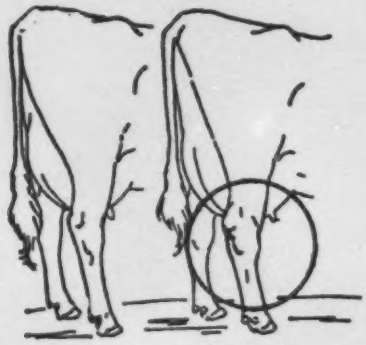
Comments:

1. Income is affected by hoof injuries. Milk production drops when a lame cow is unwilling to graze or compete for feed.
2. Management practices are important in preventing injury.

SWOLLEN HOCKS

Swelling of the hock due to injury and often resulting in infection

Detection: 1. Lameness, cow moves slowly or is unwilling to move



2. Swollen hock on the inside, outside, or both sides of the leg

3. Red, swollen, encrusted hock (Blood or pus may be oozing from a break in the skin.)

4. Appetite and weight loss (Milk production may drop as the infection worsens.)

Treatment: 1. Keep cattle well-bedded.

2. Avoid slippery surfaces, alleyways, etc.

Cause: Bumping into or falling on hard, sharp corners or objects that bruise the hock and break the skin.

Prevention: 1. Keep floors dry, especially in freestalls.

2. Use rubber mats and bed cattle well.

3. Avoid exciting cattle while they are on wet or slippery surfaces.

Comments: Swollen hocks are often seen in freestall barns and areas with concrete floors that are wet. Management practices are important to injury prevention.

UNIT 14 OTHER DISEASES

UNIT 14 VOCABULARY

adrenal (ad re nal)	: glands located on the upper part of the kidneys; a secretion from these glands
blood serum (se rum)	: a yellowish fluid which separates out of the blood when blood clots
convulsion (con vul sion)	: a violent, uncontrolled spasm or movement of the muscles
dextrose (dex trose)	: a sugar found in plants and animals
dilated (di lat ed)	: made larger or wider
glucocorticoid (glu co cor ti coid)	: a body secretion that aids in the production of sugar in the body
glucose (glu cose)	: a sugar found in plants and animals
granular (gran u lar)	: being of a grain-like texture
lactate (lac tate)	: to produce and secrete milk
lymph nodes	: tissue which is involved in the system which cleans and bathes body tissue and fights foreign matter
paralyzed (par a lyze)	: made powerless, unable to move
relapse (re lapse)	: to slip back into illness
saturation (sat u ra tion)	: to be thoroughly soaked with or filled with a substance

PINKEYE

A highly infectious disease affecting the eye, often spread by flies

Detection:

1. Watery eyes, staining hair or face
2. Red and swollen eyelid lining
3. Cow is very sensitive to light
4. Opaque or cloudy cornea
5. Pus around the eyes, area around the eyes becomes encrusted
6. Cattle may have difficulty seeing or become blind in severe cases, take care not to excite them.
7. Fever, loss of appetite, and a drop in milk production may occur in severe cases.

Treatment:

1. Apply antibiotics specific for Pinkeye.
2. Increase vitamin A in the diet.
3. Place cattle in a dark barn and control flies.
4. Place over the infected eye commercial patches which prevent flies from spreading the disease and retain the antibiotics longer in the eye.

Cause:

1. Bacteria and virus (IBR virus especially)
2. Spread by flies from infected cattle
3. Vitamin A deficiencies which make cattle less able to fight infection

Prevention:

1. Control flies.
2. Supply proper levels of vitamin A.

Comments:

1. Runny eyes may indicate other diseases, such as respiratory infection or eye injury.
2. Consult your veterinarian before starting any treatment.

LUMPY JAW

A long-lasting disease of the bony tissue of the head

Detection:

1. Tumor-like lumps (hard, soft, filled with pus, or having a grainy texture) of the jaw, mouth, tongue, nose, throat, skin, and/or lymph nodes
2. Animal is unable to eat or has difficulty eating
3. Swollen mucous linings of the mouth
4. Loosened teeth

Treatment:

1. Call veterinarian when swelling first occurs.
2. Iodine is the most specific treatment and is used internally, intravenously, or applied directly to the lesion.
3. Antibiotics may be helpful in early stages.
4. X-rays
5. Remove dead tissue by surgery and pack infected area with iodine.
6. Success of treatment depends on the lesions' size and location.

Causes:

1. A fungus: *Actinomyces bovis*, which is believed to be in the mouth of all animals
2. Fungi may enter the body when the skin or mucous lining is broken or injured or when there is a diseased or injured tooth.
3. Fungi may be carried into the mouth with grasses or other foodstuffs.
4. Infected animals carry the disease.

Prevention:

1. Isolate infected cattle.
2. Promptly treat small mouth wounds, infection sites, and teeth.
3. No specific form of prevention is available.

Comments:

1. Advanced cases are hard to treat and are often treated without success.
2. Watery eyes, appetite loss, runny nose, and scaly leathery skin usually indicate iodine saturation or excess. Stop treatment for 1 or 2 weeks. Abortion may also occur if the cow is in the later stages of pregnancy.
3. Avoid treating milking cows. Iodine will lower milk production and be secreted in the milk.
4. Infection may last for months or years. Since infected animals are carriers, slaughter may be the best form of prevention and be more profitable

RABIES (ra bies)

A severe inflammation of the brain and spinal cord

Detection:

1. Slight change in behavior
2. Excessive drooling
3. Animal stays away from others and stops eating and drinking
4. After 1 to 3 days, the cow may become paralyzed or vicious. Many animals bite, but affected cattle will butt at moving objects.
5. Frequent urination
6. Milk production stops
7. Eyes and ears of infected cattle will follow movements
8. Cattle bellow
9. The cow appears to have a foreign object in its mouth. (Chewing and swallowing muscles are affected by the disease.)
10. Coma and death follow soon after the cow becomes dangerously aggressive.

Treatment:

1. Vaccinate and isolate the bitten animal for four months or longer.
2. Cattle which have been bitten and vaccinated should be revaccinated and isolated for 30 days.

Causes:

1. A virus, transferred in saliva during biting.
2. Infection of new wounds (although this is rare)
3. Dogs, fox and skunks often spread the virus.

Prevention:

1. Destroy unvaccinated animals that have been bitten by known rabid animals.
2. Mass vaccination of dogs and disposal of strays.
3. Reduce large wildlife populations.
4. Vaccinate cattle in areas where rabies is a problem.

Comments:

1. If you suspect an animal has rabies, DO NOT put your hands into the animal's mouth.
2. The virus may be present and passed on before the infected animal shows any signs of the disease.

RABIES - continued

3. For human safety any animal suspected of being rabid should be considered so until tested.

4. The brain of suspect aniamls should be examined by a veterinarian when the animal dies.

METABOLIC DISORDERS (met a bol ic dis or der)

Diseases or body disorders that affect the function of tissues

KETOSIS (ke to sis)

Affects lactating cows, often occurring a few days or weeks after calving

Detection:

1. Appetite and weight loss with a drop in milk production
2. "Wood smoke" smell on breath
3. Awkward movement
4. Lab tests indicate low blood sugar and high ketone blood levels
5. Listless or very excited (in the case of nervous ketosis)

Treatment:

1. Increase blood sugar levels. Consult with veterinarian to determine the best method for your herd.
   a. Intravenous glucose injection - shows quick results, but is used up rapidly by the body and other treatments are then required
   b. Injection of glucocorticoid (glu co cor ti coid) caise glucose production by the body resulting in normal blood ketone levels in 3 to 5 days
   c. Drenching with sodium propionate (pro pi o nate) propylene glycol (pro pyl ene glycol), or lactate mixtures. These also may be mixed with feed.
   d. Chloral hydrate (chlo ral hy drate) - for nervous ketosis
   e. Combinations of the above treatments
2. Proper feeding after recovery is important for the animal to return to full production and health.

KETOSIS - continued

Cause:

1. The symptoms are caused by low bood sugar and high ketone levels in the blood. The exact cause of these symptoms is not known. Two main theories are that the stress of beginning to lactate causes a lack of either propionic acid or glucocorticoid which are needed for glucose production.

2. Secondary ketosis may result when a cow is ill. This stress may result in a shortage of glucose in the blood, causing ketosis.

Prevention:

1. Change feed for the last 2 weeks of the dry period and early lactation. Check with your veterinarian for specific recommendations.

2. Avoid fat cows (Fat Cow Syndrome) especially during dry period.

3. Avoid quick changes in roughages before calving.

4. Feed high energy feeds and alfalfa hay.

5. Feeding ¼ pound of propylene glycol or sodium propionate daily may be helpful in problem herds.

Comments: Primary ketosis usually affects high producing cows, while secondary ketosis may affect any animal suffering from a disease.

MILK FEVER

A paralyzing disease which usually occurs 72 hours after calving

Detection:

1. Cow is unsteady on her feet (early stages)

2. No appetite

3. Cow lays on chest with her head to one side or turned into the flank

4. Dull eyes with dilated or enlarged pupils; the cow stares

5. Dry muzzle, cold feet, cold ears

6. Pulse: 50-85 beats per minute

7. Normal or below normal temperature

8. No defecation and a relaxed anus

9. Coma and death if treatment is delayed

MILK FEVER - continued

Treatment:

1. Inject calcium fluid intravenously, beneath the skin, or into the body cavity to raise blood serum calcium levels to normal.
2. Add magnesium to the calcium injection if a veterinarian diagnoses that the cow is deficient in magnesium.
3. Add dextrose if ketosis is also present.
4. Downed cows are usually treated with a commercial preparation of calcium, magnesium, dextrose, and phosphorus to cover all or any secondary diseases.

Cause: Low levels of calcium in the blood.

Prevention:

1. Feed high-phosphorus, low-calcium rations during late pregnancy.
2. Feed large doses of vitamin D, 5 to 7 days before calving; however, poisoning may occur if too much is given. The cow is also more likely to contract milk fever if the vitamin treatment stops more than 4 days before calving.
3. Incomplete milking may have some value, but increases the likelihood of mastitis.

Comments:

1. Milk fever may be a cause of difficult calving.
2. Milk fever is associated with the sudden start of heavy milk production in cows from 5 to 9 years of age.
3. Some cows may go down with milk fever and not get up right after treatment. If the cow fails to get up 8 to 12 hours after treatment, treat again.
4. Fresh cows with acute mastitis may show many of the signs of milk fever - be sure and check the udder.

GRASS TETANY - GRASS STAGGERS

Contracted by heavy milk producers on lush pastures

Detection:

1. Walks with stiff gait
2. Sensitive to sound and touch
3. Urinates often
4. Rapid heart rate, very excited
5. Convulsions
6. Throws head up and bellows, gallops in a blind and wild manner, then falls
7. Death occurs a few hours after the cow has fallen with convulsions or a paddling motion of the legs.

Treatment:

1. Give injection of magnesium sulfate or magnesium and calcium solutions.
2. Feed magnesium-rich mineral supplements.
3. Protect cows from the wind and cold.
4. Treat disorders occurring with Grass Staggers.

Cause:

1. Low levels of magnesium and often calcium
2. Heavy milk production and grazing on lush pastures, including cereal crops.
3. Exposure to cold and changeable weather

Prevention:

1. Provide protection from weather.
2. Fertilize pastures.
3. Limit grazing on lush pastures, feeding hay beforehand.

Comments: Have blood tests taken to determine if other diseases are present before treating.

UNIT 15 PARASITES

UNIT 15 VOCABULARY

abscess (ab scess)	: a swollen, inflamed area where pus has gathered
hemorrhage (hem or rhage)	: heavy, uncontrolled bleeding
infestation (in fes ta tion)	: occurring in large numbers
irritation (ir ri ta tion)	: bother; causing soreness; itchy, pain
larva (lar va)	: an insect or organism in a worm-like stage (larvae: more than one)
lesion (le sion)	: injury or abnormal change in body part due to disease or parasites
lymph system	: the system which cleans and bathes the body cells
pesticide (pes ti cide)	: a chemical used for killing pests: insects, weeds, harmful organisms
precaution (pre cau tion)	: to take care against possible danger, beware
predispose (pre dis pose)	: to make susceptible, to disease
species (spe cies)	: a single or distinct type of plant or animal
susceptible (sus cep ti ble)	: open or subject to disease

EXTERNAL PARASITES

Organisms which live off of the outer body, skin, hair

LICE

Detection:

1. Biting, rubbing, and scratching affected areas, especially the withers, poll, neck, top of the back, and tailhead.
2. Irritated skin
3. Hair rubbed off
4. Dull sparse hair coat
5. Lice and/or their eggs may be seen after parting the hair
6. Fatigue and listlessness (anemia due to severe infestation)
7. Appetite loss with a drop in milk production (severe infestation)

Treatment:

1. Clip hair in infested areas and dust with pesticide specific for lice.
2. Give proper diet, one high in vitamins and minerals.

Cause:

1. Three species of louse
2. Winter confinement, especially in close quarters

Prevention:

1. Treat herd regularly with pesticides specific for lice.
2. Clip heavy hair coats.
3. Maintain a healthy, clean, well-fed herd, which is less likely to become infested.

Comments: Even a mild infestation causes a loss of income.

MANGE - BARN ITCH

Detection:

1. Rubbing and scratching; hair loss begins at the tailhead and then spreads to the other parts of the body
2. Thickened and wrinkled skin with a scabby, crusty dandruff
3. Under a microscope mites can be seen from skin scrapings

Treatment: Spray regularly with a pesticide recommended by your veterinarian.

Cause: Four types of mites: *Chorioptes* being the most common

Prevention:

1. Apply pesticides specific for mites regularly, especially in winter months.
2. Keep cattle clean and clipped.

Comments: As with other parasites, mild infestations affect income.

RINGWORM

Detection:

1. Circular, gray, crusty patches on the skin, usually around the ears, eyes, head, and neck
2. Scratching and rubbing the infected area
3. Fungi seen under a microscope

Treatment:

1. Remove the crusty scab with a stiff brush and mild soapy water. Apply tincture of iodine or sulfur iodide.
2. Wash and disinfect pens and stalls of infected cattle; use a fungicide as recommended by your veterinarian.
3. Inject cattle with vitamins A, D, and E.
4. Expose cattle to sunlight; the ultra-violet rays destroy the fungi.
5. Spray cattle with a fungicide only under veterinarian direction and in severe cases.

Cause:

1. A fungus: *Trichophyton verrucosum*
2. Contact with an infected animal or human

Prevention:

1. Isolate new animals or those returning from fairs.
2. Isolate and treat infected animals.
3. After handling infected animals, wash hands thoroughly to avoid infecting yourself, other livestock, and other humans.

Comments: Cattle which have access to sunlight are less likely to be infected.

TICKS

Detection:

1. Irritation: cow is restless, rubs, scratches, licks, and bites herself
2. Ticks and tick wounds
3. Anemia, dull hair coat, lack of appetite, fluid build-up, and listlessness may be symptoms depending upon the species and degree of infestation.

Treatment:

1. If only a few ticks are present they can be picked off by hand. Be careful not to break off the mouthpart in the skin as this will result in infection. To remove ticks, grasp the body and gently move it back and forth until it releases its mouthpart from the skin. Swabbing the tick with kerosene will also cause it to withdraw from the skin.
2. Treat abscesses or irritated wounds as recommended by your veterinarian.
3. Spray or dip animals with a veterinarian-recommended pesticide.

Cause: Several species of ticks present in tall grass.

Prevention: Spray and dip cattle with an approved pesticide regularly in problem areas.

Comments:

1. Take note of special regulations on spraying pesticides on milking cows.
2. These ticks may also bite humans.

FLIES AND MOSQUITOES

Detection:

1. Presence of flies and mosquitoes on cattle
2. Swishing of tail; cattle are excited and run wildly
3. Wounds or blood, particularly around the face or on the udder
4. Drop in milk production and anemia (when large numbers of flies are biting the cow)

Treatment:

1. Apply approved dusts and sprays.
2. Treat wounds to prevent infection.

Cause:

1. Shallow bodies of water, wet spots, open ditches, and shallow ponds are breeding grounds for mosquitoes.
2. Manure build-up and cow pies in pastures are breeding grounds for flies.
3. Failure to dip or spray cattle allows the development of flies from grubs.

Prevention:

1. Spray infested areas and livestock quarters.
2. Spray and dust cattle with approved pesticides.
3. Treat wounds that are attractive to flies.
4. Spray and/or remove breeding grounds, drag pastures to spread manure, drain wet spots, maintain ponds and ditches, and spread or confine manure daily.

Comments:

1. Do not allow pesticides to contaminate feed, milk, or milking equipment.
2. Face flies spread pinkeye.

CATTLE GRUBS

(HEEL FLIES, BOT FLIES)

Detection:

1. Cows running wildly with tails high in the air on warm, sunny days.
2. Lump on cow's back (Eggs are laid on the hair of the legs. The eggs hatch a short time later and the larvae burrow into the skin, moving through the body, finally appearing on the back as a lump. The flies emerge from the skin in early summer.)

Treatment:

1. Dust or spray with a pesticide recommended by your veterinarian.
2. Wash and scrub the affected part of the back with a pesticide specific to grubs.

Cause:

1. Heel flies and bot flies
2. Failure to spray cattle

Prevention: Spray or dust with pesticides recommended by your veterinarian.

INTERNAL PARASITES

Organisms living off of an animal, inside the body which affect the digestive system, lungs, liver and other organs

STOMACH WORMS

Detection: The symptoms vary with the type of stomach worm. There may not always be observable symptoms.

1. Diarrhea or constipation
2. Anemia
3. Fluid build-up below the jaw
4. Weight loss, weakness, rough hair coat, loss of appetite, and drop in milk production
5. Larvae or eggs are sometimes seen in manure
6. Death
7. Lesions and hemorrhages seen in the digestive tract when an autopsy is performed

STOMACH WORMS - continued

Treatment:

1. Consult your veterinarian for a correct diagnosis and the specific medication and method of treatment to use.
2. Provide a balanced ration.
3. Repeat treatment at regular intervals, changing medication as recommended by your veterinarian to avoid a build-up of resistance of the worms to a particular medication.

Cause:

1. *Haemonchus placei:* large stomach worm, wire worm
2. *Trichostromgylus axei:* small stomach worm, bankrupt worm
3. *Moniegia expansa* and *Moniegia benedeni:* tape worms
4. *Ostertagia ostertagia:* medium or brown stomach worm

Life Cycle:

1. Larvae hatch soon after being passed from the body in the feces.
2. Cattle eat the larvae while grazing or eating forage from the ground.
3. Larvae mature and reproduce in the digestive tract; the eggs pass out of the body in the manure.

Prevention:

1. Remove cattle from infested pasture for several days. Spread or break up cow pies by dragging the pasture.
2. Treat the entire herd on a regular schedule.
3. Rotate pastures and drag them regularly.
4. Feed a balanced ration.
5. Change medication to avoid the build-up of resistance by the worms.

Comments: Cattle are usually infested with several parasites; therefore, a veterinarian must be consulted to be sure that you treat for all worms that are present.

LUNGWORM

Detection:

1. Rapid, shallow breathing (Loud sounds may also be heard from the lungs.)
2. Loose, husky cough often following exercise
3. Larvae in the feces
4. Heavily infested cattle stand with outstretched heads and open mouths and drool
5. Death
6. Lesions, eggs, larvae, and adult worms can be seen in the respiratory tract when an autopsy is performed

Treatment:

1. Consult your veterinarian to determine the specific medication and treatment to use.
2. Move cattle to clean pasture or clean, well-bedded quarters.
3. Provide a balanced ration.

Cause: *Dictyocaulus viviparus* is the most common species

Life Cycle:

1. Eggs are laid in the air passages, then coughed up and swallowed.
2. The eggs hatch as they pass through the digestive system and are passed out of the body in the feces.
3. Cattle swallow the larvae while grazing or eating forages from the ground.
4. Larvae move from the digestive system into the lymph system and finally into the lungs, where they lay their eggs.

Prevention:

1. Separate young stock from infected cattle; do not allow the two groups to share pastures.
2. Use hay racks; avoid feeding forages on the ground.
3. Use available vaccines.

Comments:

1. Young stock are more likely to become heavily infested with lungworm. Mature cows, although a source of infection, often cure themselves by coughing up the mature worms.
2. Death is often caused by pneumonia. Pneumonia results from irritation of lung tissue by the worm. The lungs then produce large amounts of mucus in which bacteria thrive.

UNIT 16 CALF DISEASES

UNIT 16 VOCABULARY

broad spectrum (spec trum)	: affecting many organisms
contagious (con ta gious)	: spread easily by contact
electrolyte (elec tro lyte)	: a mixture of salts (table salt, baking soda, potassium salts) with water that is fed to cows or calves that have lost large amounts of body water
enema (en e ma)	: a liquid injected into the rectum to clean out the large intestine
hutch	: a specially built housing unit for a calf
infective (in fec tive)	: likely to cause infection
ingest (in gest)	: to eat
not thrifty	: not healthy, in poor condition
oocysts (oo cysts)	: an organism undergoing development
plastered (plas tered)	: to cover, glued to or stuck on
selenium (se le ni um)	: a mineral which is needed by plants and animals in very small amounts
symptom (symp tom)	: a sign of a disease

SCOURS

Diarrhea of new born or very young calves

Detection:

1. Dull, listless
2. Light-colored diarrhea with a foul odor (not always present)
3. Appetite loss
4. Loss of body water, dull and sunken eyes
5. Temperature varies from below normal to 40.5° C (105° F)
6. Scours last only a few hours or several days (Some cases may last several weeks. The calf will then become very thin, plastered with manure, pot-bellied, and unthrifty.)
7. Death

Treatment:

1. Consult your veterinarian early for the proper medication, which depends upon the infecting organism.
2. Give animal an electrolyte solution to treat for body water loss.
3. Give enemas as recommended by a veterinarian.
4. Reduce the amount of milk fed.
5. Keep the calf in a dry, draft free, and warm environment.

Cause:

1. A bacteria: *Escherichia coli* is the most common cause and other bacteria may add to the problem
2. Viruses
3. *Coccidia:* Parasites in the digestive tract (See page 100)

Prevention:

1. Wash and disinfect milk and water pails with each feeding.
2. Disinfect stalls and pens on a set schedule.
3. Isolate sick calves.
4. Put calves in individual stalls.
5. In badly affected herds, treat calf at birth as recommended by your veterinarian or vaccinate cow before birth.
6. The most important factor in prevention of all calf diseases is to make sure that the calf receives colostrum as soon as possible after birth.

Comments: It is very important to detect the disease as soon as possible before the bacteria gains a stronghold. Death occurs rapidly unless the calf is treated quickly.

JOINT ILL - NAVAL ILL

Detection:

1. Painful and swollen naval, naval may contain pus
2. Listless, no appetite
3. Fever
4. Infection may spread to the entire body
5. Stiff and swollen joints
6. Death

Treatment:

1. Give broad-spectrum antibiotics: those antibiotics which have an affect on a large number of organisms.
2. Clean and disinfect the naval.
3. Provide clean, dry quarters.

Cause:

1. Bacteria entering the body through the naval, shortly after birth. Often due to failure to disinfect naval with tincture of iodine.
2. Wet, damp bedding, disease build-up in barn

Prevention:

1. Dip the naval in tincture of iodine immediately after birth. This is the best and most important method of prevention.
2. Allow calving in pasture.

Comments:

1. Treatment is seldom successful because infection spreads before any symptoms can be seen.
2. Establish a habit of dipping navals in iodine immediately after birth to avoid this disease.

PNEUMONIA (pneu mo nia)

Inflammation and fluid build-up in the lungs

Detection:

1. Listless, off-feed
2. Fever
3. Difficult breathing with short hacking cough after exercise
4. Unthrifty; diarrhea may be present
5. Several calves may show the same symptoms, as infection quickly spreads.
6. Death

Treatment:

1. Give antibiotics or sulfa drugs as recommended by your veterinarian.
2. Determine stress factors and correct them.

Cause:

1. Virus with bacteria often adding to the problem
2. Stress which lowers the calf's resistance: due to drafty, wet housing with poor ventilation, parasites
3. Infected cattle brought into the herd or contact with infected cattle

Prevention:

1. Practice sanitation.
2. Isolate new cattle.
3. Isolate infected cattle.
4. Provide proper ventilation and housing.
5. Feed a proper diet.

Comments: Pneumonia is highly infectious and usually causes death if not treated early.

COCCIDIOSIS (coc cid i o sis)

Infection of the intestines by a protozoan

Detection:

1. Watery and thin diarrhea, later containing pus, mucus, and sometimes fresh blood
2. Appetite and weight loss
3. Listless with gaunt appearance
4. Sides and tail plastered with manure
5. Oocysts of the protozoan in the manure (when viewed under a microscope)
6. Death

Treatment:

1. Give sulfa medication. Consult your veterinarian for specific treatment.
2. Provide clean, well-bedded shelter with fresh water and feed.
3. Prevent water and feed from being contaminated by manure.

Cause:

1. A protozoan: *Coccidia*
2. Cold damp housing or weather
3. Contamination of feed and water by infested manure

Life Cycle:

1. Feed or water contaminated by oocysts is eaten.
2. Oocysts move through the digestive system to the intestines.
3. Oocysts invade the intestinal lining, destroying tissue and reproducing. They mature into resistant oocysts that are passed out of the body with the feces.
4. In a damp, cold climate the oocysts become infective. They contaminate feed and water and the cycle begins again.

Comments: Coccidiosis is common in calves less than a year old. Mature cattle develop resistance, but act as carriers spreading the infection.

WHITE MUSCLE DISEASE

A disease affecting your stock causing muscle breakdown

Detection:

1. Stiff, weak, or trembling muscles, especially after exercise
2. Knuckling under of front feet
3. Hard and swollen muscles
4. Difficult breathing and swallowing
5. White streaks in the muscles (seen when an autopsy is performed)
6. Death

Treatment: Give selenium and vitamin E injections or add them to feed.

Cause: The cause is not entirely understood, but deficiencies of the mineral selenium and vitamin E are involved.

Prevention:

1. Be sure to include selenium and vitamin E in calf and pregnant cow rations.
2. Feed or inject alpha-tocopheral.
3. Feed green hay and grains that are high in vitamin E.

Comments:

1. New York State soils are deficient in selenium.
2. White muscle disease usually only affects young stock.

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